

EIT FOOD RIS3 GUIDEBOOK

A call to action for agrifood
policy makers and doers

2022



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During 2020, EIT Food with University of Warsaw
carried out a comparative analysis of agri-food
innovation policies in 17 countries of EIT Food RIS.
During 2021, the data collected by the 17 experts, have
been further summarised, by an external expert into 17
Country fiches and 17 Gap Analysis.

Another part of the material is an outcome of individual
interviews conducted with 8 RIS3 experts in 2022.
Additionally, hypotheses and findings were elaborated
in cooperation with members of the EIT Food RIS Policy
Council. The EIT Food RIS Policy Council is a policy
advisory body, consisting of stakeholder representatives
from EIT RIS countries. The Council supports EIT Food
in policy dialogue and other interactions in the target
countries, contributes towards the further elaboration of
EIT Food instruments and projects, as well as promotes
linkages with government authorities and other
stakeholders.

ABOUT EIT FOOD

EIT Food is Europe's leading food innovation initiative,
working to make the food system more sustainable,
healthy and trusted. The initiative is made up of an
innovation community of key industry players across
Europe, consisting of over 90 partner organisations
and over 50 startups from 16 EU member states. It is
one of the Knowledge and Innovation Communities
(KIC) established by the European Institute for
Innovation & Technology (EIT), an independent
EU body set up in 2008 to promote innovation and
entrepreneurship across Europe.

You can follow EIT Food via www.eitfood.eu



ABOUT NATURAL INNOVATIONS LAB

Natural Innovations Lab is sustainability advisory
focusing on climate and environmental mitigation
services, i.e. GHG emissions measurement, Life
Cycle Assessments, non-financial reporting and
EU Taxonomy advisory. Our approach is based on
business development through providing benefits
for natural environment and people. We translate
complexed sustainability frameworks into priorities
that really matter to clients / consumers / citizens.

Please visit our website: nil.eco/en



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Contents

Abbreviations	05
Introduction	06
Why policy framework (RIS3) matters? RIS3 rationale and main concepts.	10
Engaging agrifood actors in the RIS3 process	12
RIS3 experience in 17 countries with EIT Food RIS Hubs Network – outcomes of policy gap analysis	20
	20 Approach and methodology
	20 RIS3 input process bottlenecks
	22 RIS3 output-related gaps
	24 RIS3 agrifood policy needs
Challenges and solutions for successful Smart Specialization Strategies (RIS3) implementation in the agri-food sector – outcomes of an expert research	26
	26 Approach and methodology
	27 Systemic challenges and funding architecture
	28 Understanding the regional ecosystem and potential – towards an open and participatory processes
	31 Communicating RIS3 programmes to potential beneficiaries and stakeholders of the process
	33 Building innovation capacities and transferring knowledge among stakeholders
	35 The role of governance in RIS3 projects
	40 Collaboration between stakeholders of innovation projects
	40 Recognizing the importance of third sector
	42 Establishing success indicators of RIS3 implementation
Managing digital transformation in the agrifood sector – the EDIH role	45
Bioeconomy as catalyst for the Green Deal	47
Summary	53
Appendix 1 – Future of agrifood sector after COVID19 a foresight perspective	54
Appendix 2 – Members of EIT Food RIS Policy Council 2021/2022	57
Bibliography and online resources	58

Abbreviations

4H	– quadruple helix
AKIS	– Agricultural Knowledge and Innovation Systems
CAP	– Common Agricultural Policy
ECA	– European Court of Auditors
EDIHs	– European Digital Innovation Hubs
EIT	– European Institute of Innovation & Technology
ERDF	– European Regional Development Fund
FP7	– 7 th Framework Programme for Research and Technological Development
IPR	– Intellectual Property Rights
ISS	– Innovation Support Services
JRC	– Joint Research Centre
KETs	– Key Enabling Technologies
MAA	– Multi actor approach
NUTS	– Nomenclature of territorial units for statistics
ODP	– Open Discovery Process
PRI	– Partnerships for Regional Innovation Playbook
RIS3	– Research an Innovation Smart Specialisation Strategies
ROP	– Regional Operational Programmes
SDGs	– Sustainable Development Goals
TEDv	– Territorial Economic Data Viewer



Introduction

Context of the Guidebook

Innovation policies are not something new within the European Union. In March 2000, the European Union set itself the ambitious goal to become, by 2010, “the most competitive and dynamic knowledge-based economy in the world”, what has become known as the Lisbon strategy.

It took several policy cycles regarding innovation until a paradigm shift was made through the concept of Research and Innovation Smart Specialisation Strategies (RIS3) and started the development of new concepts, to reach the today's policy maturity stage.

“The European Parliament...underlines that interventions targeting research and innovation should capitalize on regional assets and capacities and form part of a regional innovation strategy based on smart innovation...highlights the need for place-based policies and considers that cities and regions should pursue smart and sustainable specialisation...”¹

We are living in the second cycle of programming, based on the concept of the Smart Specialisation, which now has even more implications on funding innovation, RDI, entrepreneurship and a pivot for a new generation of policy concepts: Resilience, Green Deal, Digital Transformation.

By the adoption of the New European Innovation Agenda² the focus goes further to address the wave of deep tech innovation and address five challenges related to: funding scale-ups, innovation through experimentation, innovation ecosystem, attracting talents and improving policy making tools.

“We need to boost our innovation ecosystems to develop human-centered technologies. This new Innovation Agenda builds on the significant work done already

¹ EU Parliament resolution, 2011/C 161 E/16

² COM(2022) 332 final, A New European Innovation Agenda

on innovation in the last years and will help us accelerate our digital and green transition. The Agenda is rooted in the digital, physical and biological spheres and will enable us tackle better burning concerns, such as breaking the dependence from fossil fuels or securing our food supply in a sustainable way.”³

At the grass roots level, we can observe that regions which quickly adopted innovation policies and exploited in a constructive manner had managed to improve their innovation performance. This can be seen in the Regional Innovation Scoreboard and within the European Innovation Scoreboard, where the situation had slight changes over the years.

This might show a “policy divide” where understanding the complex policy framework, engaging actors, stakeholders and exploiting policy opportunities can be later seen in indicators like company investments, R&D expenditure in the business sector and innovation expenditures per person employed. Consequently, there is a connection between a good policy making process and successfully funding innovation.

Once you go deeper in the energy and labour-intensive sectors like agri-food, we can realise that without innovation we cannot optimise the situation on indicators regarding environmental sustainability like resource productivity and environmentally oriented technologies. Countries in the emerging and moderate innovators category happens that are the last on the Environmental sustainability indicator with an important agri-food share in the economy: Latvia, Portugal, Estonia, Poland, Romania, Bulgaria, Croatia, Hungary⁴.

It is a real challenge for the agricultural intensive countries and regions to adjust their development and innovation speed to the new policy framework emphasising on the new Green Deal and digital transformation that require complex transformation to reach 2030 objectives.

The recent report of the European Court of Auditors (ECA⁵) concluded that the intended synergies between Horizon 2020 and European Structural and Investment Funds, have not been used in their full potential due to the lack of the alignment between rules and regulations, limited cooperation between the two

³ M. Vestager, Executive Vice-President for a Europe fit for the Digital Age, 5 July 2022. Press release on Commission presents new European Innovation Agenda to spearhead the new innovation wave.

⁴ EIS data modelling for 2022 can be done at the following link: <https://ec.europa.eu/research-and-innovation/en/statistics/performance-indicators/european-innovation-scoreboard/eis>.

⁵ ECA, Special report 23/2022: Synergies between Horizon 2020 and European Structural and Investment Funds – Not yet used to full potential, 2022, p. 33.

Scope and goals of the Guidebook

This Guidebook is willing to help policy makers and doers, local and regional authorities and agrifood actors to better “navigate” in the complexity of the policy making process, concepts, trends and new initiatives of RIS3. Understanding of the full spectrum of the RIS3 context can create more opportunities for agrifood sector in their country and region.

In the content of the Guidebook reader will get familiar with insights and synthesis of the RIS3 policy making process and the challenges for doers and policy makers willing to create a favourable innovation environment for their region. The analysis covered 17 EU countries identified with the EIT Food RIS Strategy 2018-2020⁷ as those with biggest potential towards accelerating innovation in agrifood sector based on the following criteria:

- ◇ **Smart Specialisation Strategy** – Relevance of agri-food innovations for the national or regional economy, based on the identified Smart Specialisation Strategies;
- ◇ **Agri-food outputs** – Sizeable output of the agricultural industry, utilized agricultural area and relevance of agricultural production and food processing for the country's economy, with demonstrated concentration of activities and resources;
- ◇ **Research & Development activities** – measured by business R&D expenditures of food and beverages sectors and scientific publications from agri-food related disciplines;

After extensive analyses of empirical data and stakeholder consultations allowed to select 17 countries to be specifically targeted by EIT Food Regional Innovation Scheme (RIS) approach aimed at boosting innovation in modest to moderate innovators according

⁷ EIT Food RIS Strategy 2018-2020, internal EIT Food document.

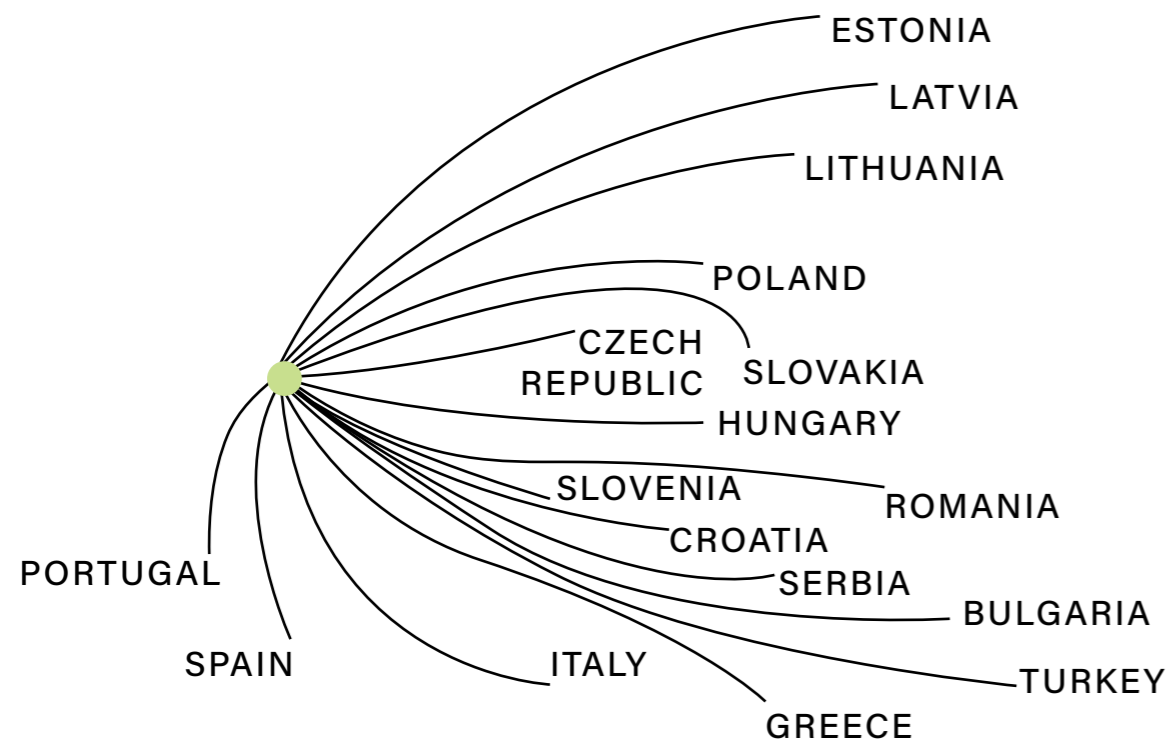
programmes' research and innovation stakeholders, and limited synergies creation between the Commission and national/regional authorities. The general proposed model is that the EISF should strengthen the research capacity to become more competitive in Horizon2020 calls (upstream synergies) and based on the results achieved in terms of intensive RDI investment, to provide funding for the exploitation (downstream synergies).

Translating this model towards the agrifood companies and innovation ecosystem might reduce the existing gaps at regional level in terms of innovation output, competitiveness, entrepreneurship etc. This may support the agrifood ecosystem capacity to integrate and exploit innovation as a part of the solution for greater food security in the EU.

While RIS3 is a policy method and tool that is consolidating the general European Innovation policy framework and a conditionality for implementing European Regional Development Fund, it had less importance for the New Common Agricultural Policy: 2023-27 (CAP). This is an evident bottleneck since majority of regions had/has agrifood as a RIS3 sector. Furthermore, the New CAP, is focusing on agriculture and rural areas to achieve ambitions of the Farm to Fork and biodiversity strategies⁶. Both ambitions along with bioeconomy, and concepts like circularity and green ambitions have direct connection with the innovation practices. Without a good acknowledgment of the innovation policy (RIS3), the agrifood actors might lose opportunities.

In the context of COVID19 lessons and the current geopolitical situation, the roles of leaders, entrepreneurs, ecosystems and policy makers at regional level are now more important than ever.

⁶ Source: https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/new-cap-2023-27_en#anewwayofworking



Countries covered by EIT Food RIS Hub network

to the European Innovation Scoreboard (EIS)⁸. In those countries EIT Food RIS Hubs have been established to dynamize the local innovation ecosystem and promote EIT Food RIS opportunities among agrifood stakeholders.

The important aspect of shift in the Innovation Policy Making in EU focuses on inclusion of climate and environmental aspects as well as on participation of stakeholders in policy making process. Readers of this document will see how EU Taxonomy can help food sector stakeholders, policy makers and investors to navigate towards sustainable activities compliant with minimum social safeguards aligned with international guidelines and conventions.

For readers who are not familiar with the EU Taxonomy regulations we provide the explanations and descriptions in this document. The EU Taxonomy is a classification system, establishing a list

of environmentally sustainable economic activities. It could play an important role helping the EU scale up sustainable investment and implement the European Green Deal. The EU Taxonomy would provide companies, investors and policymakers with appropriate definitions for which economic activities can be considered environmentally sustainable. In this way, it should create security for investors, protect private and public investors from greenwashing, help companies to become more climate-friendly, mitigate market fragmentation and help shift investments where they are most needed⁹.

Another sustainability-oriented methodological framework that was covered in Joint Research Centre's (JRC) Partnerships for Regional Innovation

⁸ More about EIS: https://research-and-innovation.ec.europa.eu/statistics/performance-indicators/european-innovation-scoreboard_en

⁹ Source: https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_e

Playbook¹⁰ is Smart Specialisation for Sustainable Development Goals (S3 for SDGs). The basic idea of S3 for SDGs is that science, technology and innovation can and should be mobilised not only for economic growth, but also to address societal and environmental challenges. This new purpose of innovation is reflected in the new metrics, diagnostic approaches, rethinking stakeholder engagement and participation, policy mix, governance, financing and budgeting for SDGs and sustainability¹¹.

From the perspective of stakeholder participation this Guidebook covers the revised approach to Entrepreneurial Discovery Process (EDP) from perspective 2014-2020, which now has retransformed into Open Discovery Process (ODP) in the perspective 2021-2027. The ODP concept aligns research and innovation actions (and policy) with economy (industrial policy) as well as society and environment (sustainability policy). Open Discovery Process relies on working backwards from goals with coalitions of stakeholders in a multi-level perspective¹².

One of the principles of this Guidebook was to provide meta-analysis of available reports, policies and frameworks in order to provide readers with synthesis which would serve as food for thought for practitioners and stakeholders of RIS3 processes.

¹⁰ D. Pontikakis, I. González Vázquez, G. Bianchi, M. Ranga, A. Marques Santos, R. Reimeris, S. Mifusud, K. Morgan, C. Madrid, J. Stierna, Partnerships for Regional Innovation – Playbook, Publications Office of the European Union, Luxembourg, 2022.

¹¹ Ibidem p. 67.

¹² Ibidem p. 109.

This document covers the most current guidelines, significant regulations and frameworks that has to be engaged in the process of design and implementation of RIS3 in 2021-2027. For those who will be interested in studying more details about the case studies and policies we encourage to deep-dive into the documents used as a reference in this Guidebook. To provide more hands-on manner, this Guidebook aims to show experiences and solutions gathered in the study with experts and practitioners of RIS3 process.

Readers can expect that this document will guide them through main thoughts and synthesis and rationale of RIS3 as policy making approach (see Chapter 2). Then, the Guidebook depicts the step-by-step process and actors of RIS3 implementation with illustrative case studies and explanation of key concepts and institutional actors involved (see Chapter 3).

Afterwards, the Guidebook presents findings and recommendations from two research studies conducted by the authors. First of them focuses on gap analysis of RIS3 strategies and RIS3-related programmes in 17 countries of EIT Food RIS, with a view to further improve EIT Food activities, outreach and targeted offering for local stakeholders. The analyses contained inputs from local experts, who were tasked with specific analytical assignments (see Chapter 4). Second study is an outcome of individual interviews conducted with RIS3 experts from various European countries supported by the analysis of available Playbooks and Guidance for RIS3 practitioners in European Union. The content of the research is illustrated by the selected case studies and examples for RIS3 implementation process (see Chapter 5).

In the following chapters the Guidebook covers the importance of two interesting dimensions of innovation in Food industry. First of them is digitalisation and how the EDIHs can facilitate the process of digitalisation among Agrifood stakeholders (see Chapter 6). Second one, focuses on Bioeconomy as a key aspect of innovation in the European food system. This chapter is supported by the analysis of interaction between EU Green Deal and the concept of the Bioeconomy (see Chapter 7).

In the summary of the Guidebook a reader will find the synthesis of the key concepts and conclusions from the analyses that are mentioned on the pages of this study (see Chapter 8).

Why policy framework (RIS3) matters?

RIS3 RATIONALE AND MAIN CONCEPTS.

Smart Specialisation Strategies (RIS3) is one of the main policy documents that have implication on funding the New Cohesion Policy for 2021-2027, but also national instruments that will target SMEs, RDI, hubs. Funds will cover topics like: innovation, technology renewal, digital transformation, research, and development. As an “ex ante conditionality”, RIS3 is a mandatory policy document for regions and countries to advance the process of negotiations with the European Commission.

The main scope of the RIS3 is increasing economic competitiveness through innovation in a broader sense and an economic transformation agenda based on 4Cs¹³ (Fig. 1):

- 1. (Tough) Choices and Critical mass** – limited number of priorities based on proven strengths translating into concentration of money only where there is a potential: scale, key enabling technologies, RDI infrastructure, entrepreneurial unique knowledge etc.;
- 2. Competitive Advantage** – mobilizing talents by matching RDI capacities and business needs through an entrepreneurial discovery process aiming to define those niches where value can be created and linked to the global value chains;
- 3. Clusters and Connectivity** – develop world class clusters focused on technology diversification, being able to create cross-sectorial linkages in the region and internationally;
- 4. Collaborative Leadership** – efficient innovation systems based on quadruple helix model (science, policy, industry, and society).

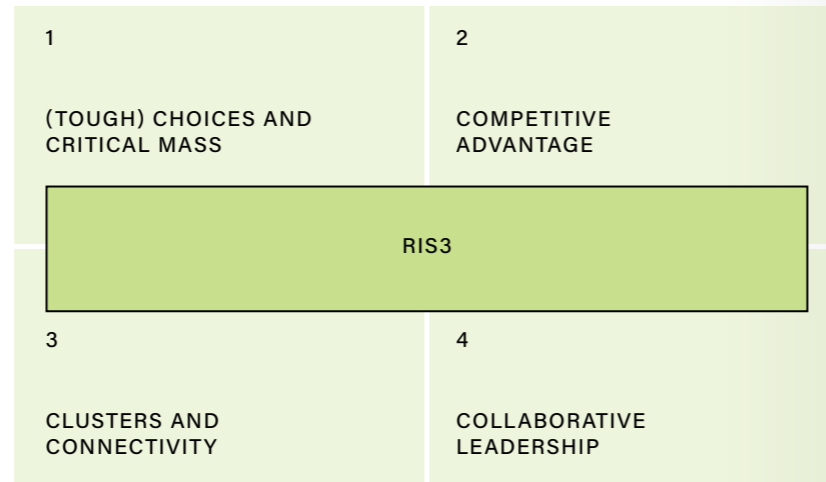


Fig. 1 — The 4C principles of RIS3.

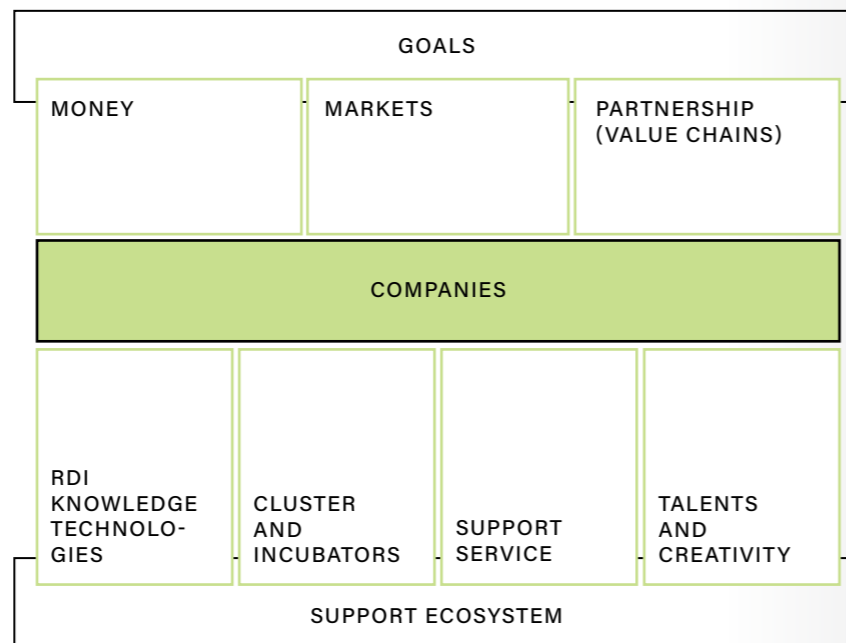


Fig. 2 — RIS3 perspective on Entrepreneurial Discovery Process (EDP).

Because the RIS3 document is being evaluated by experts from the European Commission it is essential to have a collaborative document based on intensive consultations. The paradigm proposed by the RIS3, and still relevant in the new period of 2021-2027, is that core target of the strategy are the companies. The general conclusion from practitioners is that at the end of the day, companies and entrepreneurs are innovating meaning transforming ideas into money.

From this perspective, the innovation may be seen outside the traditional relation with the research and development generally associated with the presence of the Universities and Research Centres. Consequently, companies may innovate without having the support from the research actors, for example by improving their business model.

Still it remains a valid policy option to support the RDI intensive innovation in order for the companies to capture more value locally. However, innovation in a broad sense may take place and be successful as a stand-alone entrepreneurial process within the company.

All the policy framework of the RIS3 and funded by the Operational Funds is infusing money into companies and the support ecosystem to help the companies to reach their competitiveness goals: money, markets and a better position in the value chains (Fig. 2). This loop should also reinforce itself based on the internal correlations. Companies are scaling, which means that they will need to invest in RDI intensive innovation, the support ecosystem will focus their RDI investment towards

the companies' needs and overall talents and creativity will need to be harnessed. Understanding of how this model works is the aim of the RIS3 during the sessions of public consultations with companies (Entrepreneurial Discovery Process).

“Most advanced regions invest in the invention of general purpose technologies, others invest in the co-invention of applications of the generic technology in one or several important domains of the regional economy”

— Dominique Foray 2010)

It is essential for entrepreneurs to understand that joining the RIS3 along the process of entrepreneurial discovery, is the way to step in the “policy metabolism” and create a favourable context for their businesses.

A gap in the policy framework will translate into resource dissipation, lack of expensive infrastructure sustainability and loss of opportunities in a global market.

Entrepreneurial Discovery Process is a bottom-up consultation approach, focused on entrepreneurs needs and assets that can be corroborated with local ecosystem capacities, to generate an innovation policy framework “policy mix” that is using the opportunities of Key Enabling Technologies (KETs) are steering that specific sector.

For a more practical approach we are proposing the following “EDP formula” (Fig. 3) for a faster acquisition of the concept purpose and a practical adoption during the consultation sessions.

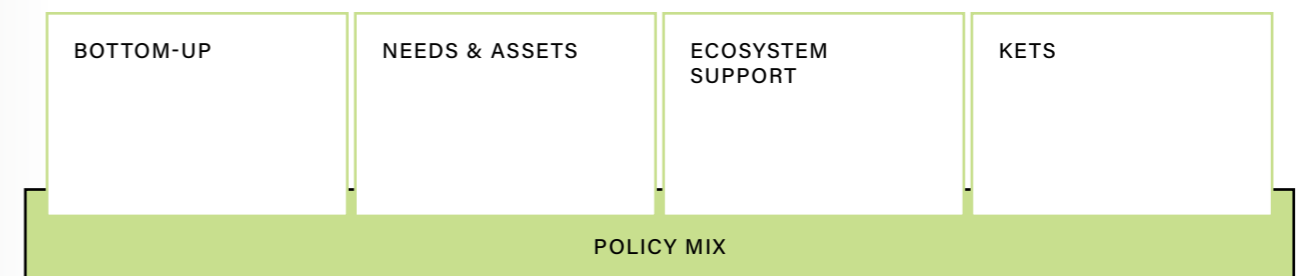


Fig. 3 — EDP formula a model of basic ingredients.

¹³ D. Foray, J. Goddard, X. G. Beldarrain, M. Landabaso, P. McCann, K. Morgan, C. Nauwelaers, R. Ortega-Argilés, Guide to Research and Innovation Strategies for Smart Specialisations, 2012, p. 17.

Engaging agrifood actors in the RIS3 process

RIS3 is primarily feeding the Regional Operational Programs (ROP) innovation component and it is adding on the policy process. RIS3 might also feed other strategies like National Research Development and Innovation, Digitalization, Green, Agrifood, Tourism etc. where the coherence needs to be shown. Furthermore,

upon the RIS3 have been built other EU support initiatives that are backed by networks at EU level: Enterprise Europe Network, European Digital Innovation Hubs etc.

Elaborating a RIS3 is already a well-established process as the following figure (Fig. 4) describes it but it has some specific nuances that make it particular and relevant for the entrepreneurs. Since agrifood entrepreneurs are needed to be engaged by the policy makers in this process the following information will show what is happening and what it is in the process for them.

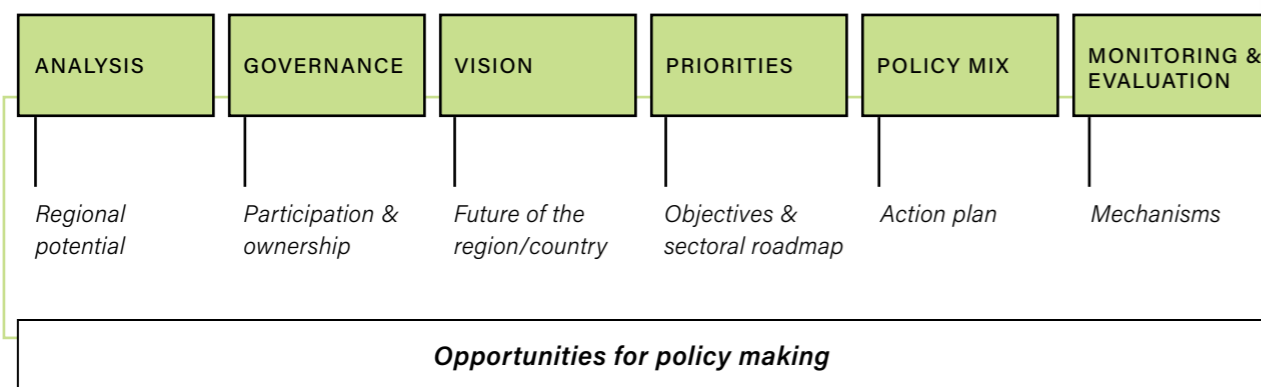


Fig. 4 – Main steps of RIS3.

RIS3 explained¹⁴

- RIS3 is not a planning doctrine that would require a region to specialize in a particular set of industries.
- RIS3 is an approach that considers whether those activities are already strong or showing promise for a region can benefit from R&D and innovation.
- Regions need to discover and develop distinctive and original areas of specialisation (and not imitate each other).
- Entrepreneurs should be encouraged to discover the right domains of future specialisations (based on clustered priorities or areas where a cluster of activities should be developed).

¹⁴ OECD, Innovation-driven Growth in Regions: The Role of Smart Specialisation, 2013, p. 13, p. 150, <https://www.oecd.org/innovation/inno/smart-specialisation.pdf>.

The core of the analysis phase in RIS3 design process is to identify the regional potential for investment. The main challenge is to avoid the “picking winners syndrome” which could keep the regional interests captive by well-established industries and actors.

Entrepreneurial discovery process is a qualitative instrument based on the participation of stakeholders. It follows a quantitative and general statistical analysis. Entrepreneurs and other relevant stakeholders must engage in the EDP at this stage to offer arguments in favour of including emerging promising niches (in sectors that have been identified by quantitative analysis) in the policy agenda.

This is due to the fact that, after identifying the critical mass of entrepreneurship activity, there is a need to gain access to qualitative insightful information related to innovation, skills and capacities. This type of particular information is usually under the “statistical radar”. Entrepreneurs need to show their competitive advantage and how it can be improved by the key enabling technologies (KETs). Even if the agrifood sector is dominated by traditional businesses, it needs to show its openness to new technologies and know-how, since these are an important part of the Operational Programmes.

Nevertheless, identifying the scaling potential is important. For small regions and countries, the internal consumption could not suffice, so international markets must be considered, even beyond Europe.

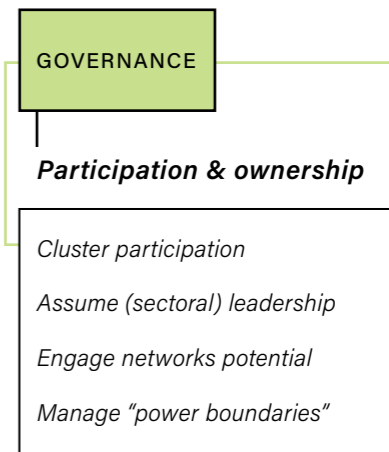
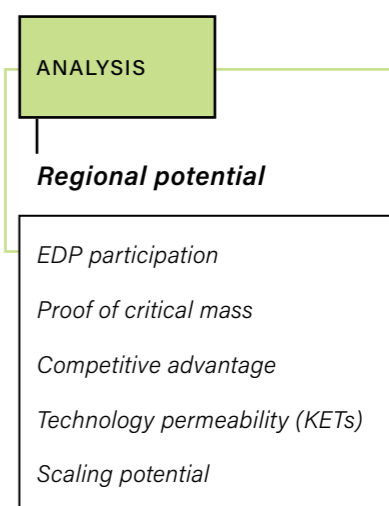
A communication campaign to attract entrepreneurs and actors is essential at this stage, to avoid many strategic bottlenecks and ensure smooth implementation later.

From a policy theory perspective, EU’s Joint Research Centre is willing to contribute to conceptual, methodological, and practical development of the open discovery process (ODP’s) by summarising the lessons learned from the EDP experience during the 2014-2020 programming period¹⁵.

¹⁵ Source: <https://s3platform.jrc.ec.europa.eu/w/what-lessons-are-there-for-open-discovery-process-odp-from-the-entrepreneurial-discovery-process-edp-experience->.

The Governance phase of RIS3 process is the way policy makers put skin in the game. It is important for the course and final result of its implementation. With no one to assume the responsibility, RIS3 will remain just a document, without funding opportunities. There are cases of government agencies pushing the responsibility for leadership in RIS3 off on each other, which caused delays in funding. In the absence of a single governance solution, several scenarios have been used so far:

- ◇ RIS3 at a regional level, in large countries, with a long track record in decentralisation, usually managed by the regional development authorities;
- ◇ RIS3 at a national level, in smaller and centralised countries, under the leadership of a single Ministry (Economy, Education, Research and Development, Entrepreneurship), or a mix of institutions;
- ◇ RIS3 at a regional level managed by regional development authorities, coexisting with a National RIS3 or a RDI Strategy, focusing more on the national funding for research institutions and managed by several ministries.



**Case Study of Australia:
Grains Research and Development
Corporation (GRDC)¹⁶**

From a policy point of view, one of the most important lessons learned is with regard to bottom-up priority setting. The greatest strength of the GRDC is its ability to capture the R&D priorities of end users and involve them directly in the process of innovation. The prioritisation process uses a structure of regional panels and consultations with growers to establish key issues for GRDC's 24,000 end users (grain farmers). This system ensures that producer and researcher priorities do not diverge from each other.

¹⁶ OECD, Innovation-driven Growth in Regions: The Role of Smart Specialisation, 2013, pp. 56-59, p. 150, <https://www.oecd.org/innovation/inno/smart-specialisation.pdf>.

Clusters explained¹⁷:

Clusters can be defined as "a group of firms, related economic actors, and institutions that are located near each other and have a sufficient scale to develop specialised expertise, services, resources, suppliers and skills".

Cluster organisations are legal entities that support the strengthening of collaboration, networking and learning in innovation clusters and act as innovation support providers by providing or channelling specialised and customised business support services to stimulate innovation activities, especially in SMEs.

¹⁷ K. Izsak, G. Meier zu Köcker, C. Ketels et al., Smart guide to cluster policy, European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, Publications Office, 2016, <https://data.europa.eu/doi/10.2873/729624>.

Regardless of the adopted solutions, at the end of the process it is important to engage with the entrepreneurs and to focus policies on helping entrepreneurs as end beneficiaries. At the end of the day, companies are exporting and creating jobs, so additional policies regarding RDI and promoting university research centres should be considered as a contribution to the support ecosystem. Deep tech companies and spin-offs incubated within universities are exceptions, found in regions with a strong support ecosystem and venture funds.

At the practical level, entrepreneurs can contribute through cluster participation and gain sectoral leadership. Clusters have already had a good track record, and they are still present on top of the European policy agenda, so business can benefit from reaching out to these organisations.

Agrifood companies should be aware that engaging only with own clusters and with their respective Ministry, will not solve the innovation challenges as they need to tackle the RIS3 responsible. Engaging the potential of clusters means leveraging additional value that stakeholders can provide for the implementation process.

According to Dominique Forray, the role of clusters is essential within the process of RIS3 creation: "Due to their inherent capacity to support cooperation between different innovation actors in a region, clusters are powerful instruments for fostering industrial competitiveness, innovation and regional growth. Currently, they are used by policy makers worldwide as building blocks for implementing different policies such as research & innovation, industrial and regional policies."¹⁸

Finally, the implementation of a solution should take into account the "power boundaries" and the responsibility for specific funding calls, later, during the implementation phase. When managing this step, the supporting JRC S3 platform advises that you focus on three main framework conditions: clear attribution of responsibilities and political support, horizontal and vertical coordination, and the availability of adequate skills and resources. (Fig. 5)

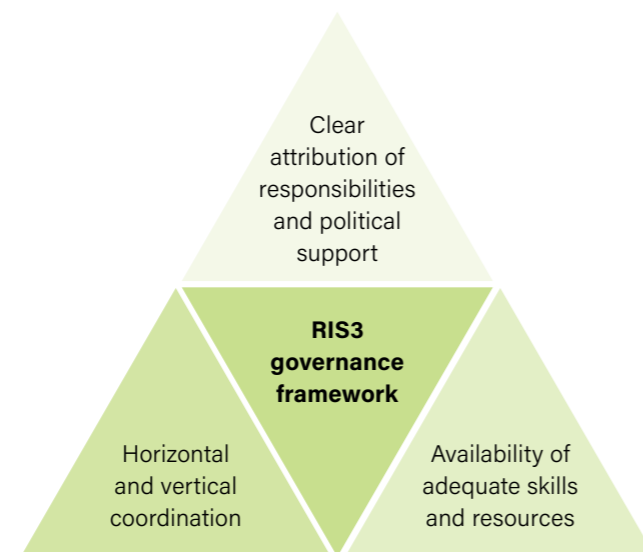


Fig. 5. RIS3 Governance framework.

¹⁸ D. Foray, J. Goddard, X. G. Beldarrain, M. Landabaso, P. McCann, K. Morgan, C. Nauwelaers, R. Ortega-Argilés, Guide to Research and Innovation Strategies for Smart Specialisations, 2012, p. 67.

In RIS3 terms, establishing a vision means having a territorial approach to innovation where the niches of the specialisation sector support transformation. RIS3 is not a form of monolithic new industrial policy, as it promotes cross-sector fertilization and key enabling technologies that can foster innovation in all sectors.

A vision might be elaborated within the expert thinking group and perhaps less present in the EDP session where the focus is on trends and changes.

Still, vision is not wishful thinking and needs to be supported by technological trends and foresight methods. Consequently, some ambition elements for a vision need to be addressed, such as technology sophistication and international positioning with respect to value chains.

Furthermore, the vision needs to be supported by sector niche policies that are based on important trends where the agrifood element is essential and provides a specialisation identity. The following are potential examples that could trigger a consolidated vision:

- ◇ Increasing the quality of life through access of quality nutritious foods
- ◇ Boosting tourism industry through improved food experience.
- ◇ Preserving the cultural identity of traditional food practices.
- ◇ Active ageing and healthy lifestyle based on top nutraceuticals.

Setting priorities is the stage where we need to establish the destination where the funding will be invested. This means also, establishing the objectives based on the premise that funding resources are scarce and cannot cover all demands. Consequently, we need focus on those objectives where we may apply the SMART criteria:

- ◇ Specific – addressing niches of specialisation,
- ◇ Measurable – quantifiable,
- ◇ Achievable – based on assets and capabilities,
- ◇ Realistic – based on market potential,
- ◇ Timely – within the policy timeframe (2021-2027).

At this stage, the objectives need to demonstrate contribution of particular knowledge and skills of the sector to the development and the transformation potential. This is a point of no return, and it is important to connect with the regional authorities and also reach national policy players.

VISION

Future of the region/country

- Territorial approach
- Economic differentiation
- Technology sophistication
- International positioning
- Quality of life

PRIORITIES

Objectives & sectoral roadmap

- Knowledge-based development
- Show transformation potential
- Connect with regional authorities
- Reach national policy players

POLICY MIX

Action plan

Promote strategic projects

Define support actions

Engage regional ecosystem

Strengthen entrepreneurship

Align EU/national policies

The policy mix is the stage where the intervention logic is defined and has a direct implication on the monitoring and indicators. This means building a matrix/frame that establishes coherence between objectives, instruments (e.g., funding, networks), as well as project portfolio and targets. Subsequently, intensive consultations with stakeholders must be repeated. The last stage before implementation provides the opportunity to establish a concrete action plan/roadmap for the next few years for the agrifoods sector. Consequently, this is the moment when strategic projects and funding mix are created.

Again, this step is not based on wishful thinking, or demands. It needs to build on strengths and potential and needs to be validated by stakeholders and political actors.

At this stage, money is allocated to the policy instruments. It is a sensitive moment where it is established who is funding what, and this process can get stuck between "power boundaries": national vs. regional, innovation vs. research, ministry vs. ministry, established vs. emerging sectors.

This step defines the funding architecture and has a direct implication in negotiation with the European Commission and can create direct delays in funding mechanisms.

The neglected part, in some cases, is the non-financial instruments that are needed for the agrifood, such as mentoring for entrepreneurs, exchange programmes for researchers, or participation in networks and knowledge hubs. These are very concrete initiatives that are adding to the RIS3 and provide an opportunity to team up with other regions to promote cross-cluster collaborations and international initiatives.

All additional resources and instruments, need to be put together to create a coherent framework between regional funding, infrastructure and soft investments (i.e. international knowledge and networking.)

When addressing the policy mix, the complexity generated by the process itself could create multi-layered interferences. In this sense, the Joint Research Centre advises to ensure the general logic of the policy mixes:

"In practice, a frequent shortcoming in policy mixes is the tendency to respond to each policy problem by the creation of a new policy instrument, without revising the overall shape of policy mixes after the addition of the new instrument. The extensive implementation of new instruments, on top of existing instruments, bears increased risks of unwanted interferences or negative interactions. The final effect of the combined use of instruments is often unknown. This holds true especially when instruments that belong to different policy levels and domains are delivered by different agencies or ministries, lacking communication channels and coordination mechanisms. This creates a large web of possible interactions, which need to be taken into account in order to identify possible inconsistencies in the implementation of the policy instruments¹⁹."

¹⁹ JRC, RIS3 Implementation and Policy Mixes, 2014, p. 8, <https://s3platform.jrc.ec.europa.eu/en/w/ris3-implementation-and-policy-mixes>.

MONITORING & EVALUATION

Mechanisms

Governance of monitoring

Measure success

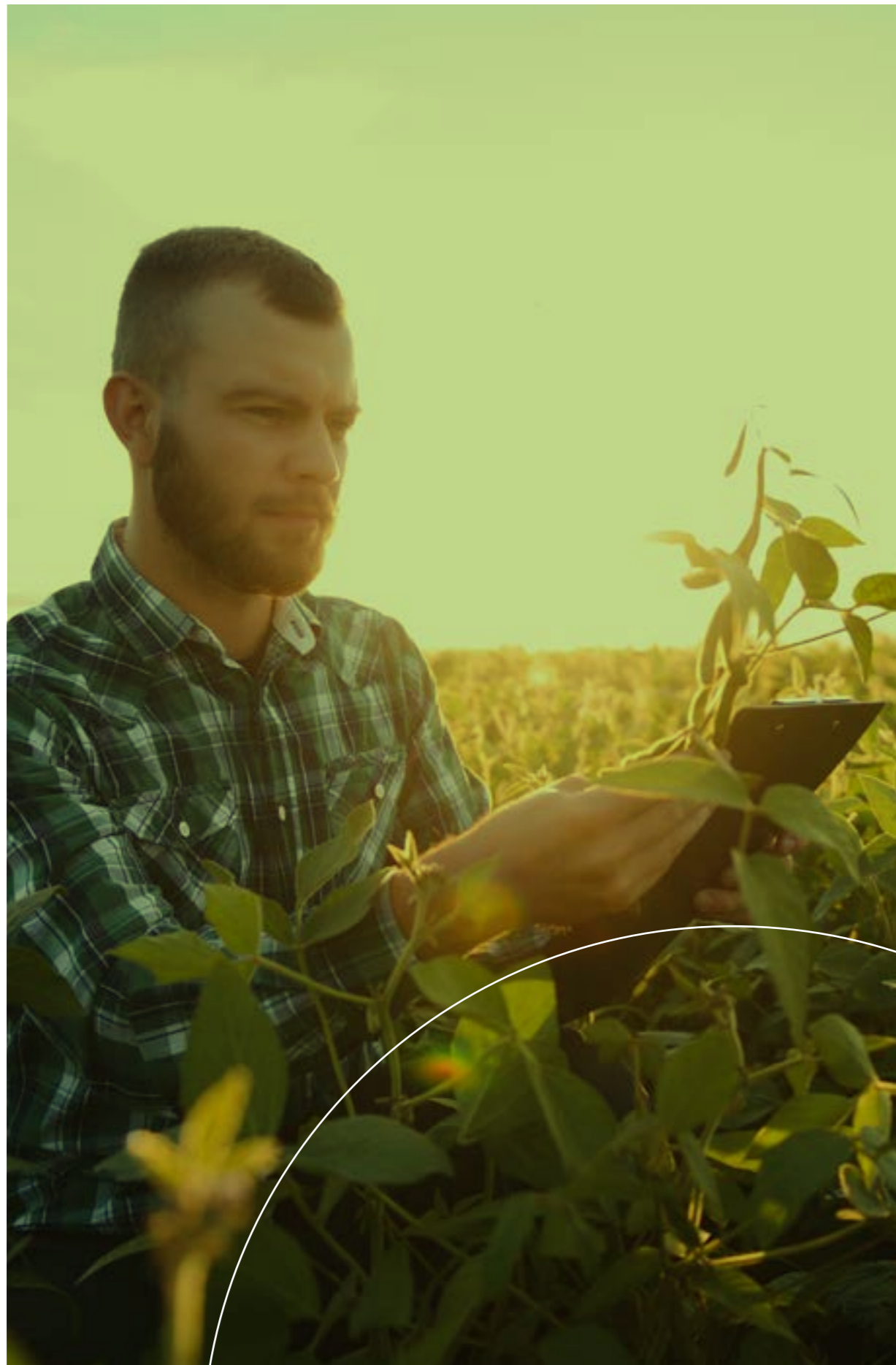
Consistency with priorities and actions

Support in improvement

RIS3 monitoring and evaluation have become increasingly important within RIS3. Some regions even adopted interim monitoring, where in the middle of the programming period an evaluation is being made. At this stage, it also implies a governance model and stakeholder consultations.

This is an important moment for policy makers and agrifood actors to help improve the policy mix during the same programming period, which can help create new funding opportunities.





Since the relation between the RIS3 process and the Regional Operational Programme (ROP) is clear, the main steps to elaborate the funding mechanism under RIS3 are represented below (Fig. 6). The general logic is that the ROP is designed to fund the Regional Investment Plan, developed by the managing authorities or regional development agencies under the supervision of the European Commission. The document defines its own policy mix related to regional infrastructure. RIS3 powers the entrepreneurship, innovation, and production technologies. ROP has a standard monitoring component based on a strict set of quantitative indicators.

The focal point is when the call manual and eligibility rules are under public consultation. At this moment all the eligibility rules, activities, co-funding, and reimbursement procedures are set in place. It is essential for entrepreneurs to join the public debate, to promote the agrifood needs and to send amendments. ROPs cover only some operations of the investments, related to food, while the agricultural part is under the common agricultural policy. However, as in any other policy process, in this process a similar approach of public consultations can be adopted.

Between public consultation and the launch call there is a limited amount of time for applicants to join the helpdesk sessions and receive support with regard to possible actions.

PROGRAM DESIGN	CALL DESIGN	CALL PUBLIC CONSULTATIO	CALL LAUNCHING
Regional investment plan	Specific funding framework	Feedback and evaluation	Receive applicationsv
Designed by management authorities and EC Defines the policy mix Feed by RIS3 priorities Standard monitoring component	Feed by RIS3 policy mix	Join the public debate Promote agrifood needs Send amendments Support favorable eligibility criteria Engage own network "Cluster" with doers	Join technical helpdesk sessions Clarify projects and activities

Fig. 6. Summarised policy process ROP 2021-2027.

RIS3	ROP 2021-2027
Monitoring & evaluation New governance structure mid-programme monitoring Interim report New sectoral objectives New policy mix New strategic projects	Monitoring & evaluation Monitoring committee Annually Monitoring report Proposals for program modification New calls proposals Reallocation of funds
PROMOTE NEW PROJECTS	PROMOTE INITIATIVES ASSIGNED FOR FUNDING

A common policy milestone is a point at which monitoring and evaluation takes place and entrepreneurs are provided with technicalities to consider.

While RIS3 could conduct another set of entrepreneurial discovery sessions to create a new policy mix within the sector, including the proposal of new strategic projects, the ROP could propose a new modification within the program, including new proposals calls based on the reallocation of funds (Fig. 7). This would be the last opportunity for policy makers and agrifood actors to promote some new investments during the programme implementation.

Fig. 7. Monitoring RIS3 and ROP 2021-2027.

RIS3 experience in 17 countries with EIT Food RIS Hubs network

RESULTS OF THE POLICY GAP ANALYSIS

Approach and methodology

In 2020-2021, EIT Food, in cooperation with the University of Warsaw, carried out a comparative analysis of agrifood innovation policies in 17 countries of EIT Food RIS, with the aim of further improving EIT Food activities, outreach, and targeted offer for local stakeholders. The analyses contained input from local experts (1 per country), who were assigned with specific analytical assignments. The experts worked closely with the University of Warsaw, EIT Food's regional offices (Co-Location Centres, CLCs) and EIT Food

Hubs (local contact points of EIT Food in each country) to deliver the analysis, which would facilitate future activities of EIT Food.

The following chapter synthesizes the main findings and conclusions from a secondary gap analysis by external experts. Their input material was the comparative analysis database, summarised in 17 tabs.

Bottlenecks of the RIS3 input process

The countries of EIT Food RIS faced some common challenges in developing RIS3, including the poor engagement of agrifood entrepreneurs in policy making, as well as managing the funding mechanisms and calls.

One of the knowledge gaps in the policy system is related to trust- and ecosystem-building among individual entrepreneurs, as well as socially innovative, multi-actor and co-creative organizations. Agrifood entrepreneurs ignored funding calls for various reasons, for example lack of awareness or interest or focusing more on the RDI system. Also, the system that supports entrepreneurship and innovation is not based on accurate data. This causes a lack of synergy in funding and low participation in the calls for the small farmers and agrifood entrepreneurs.

Successful innovation cases were made possible thanks to the support of the ecosystem. However, at the policy-making level it is harder to design, promote, and manage calls that engage both agrifood entrepreneurs and the innovation ecosystem than to manage calls and projects for single applicants. In terms of policy making, this means creating calls based on collaboration between several actors or creating calls with integrated measures, which

may reduce the number of potential applicants. Furthermore, not all countries are used to managing large-scale investment in partnership with business. Most of the large-scale investments under RIS3 were exclusively dedicated to large university platforms, which now could need additional investment to operate in the market or even keep them running.

Since most of the resources available to universities are allocated for research excellence and not innovation and applied business-related activities, the change might need time or a different approach to funding/support.

It is hard to define the farmer's access gap to new technologies. Still, they need to understand the need and strategic relevance of adopting new technologies and traceability instruments that can

demonstrate their position in the value chain and help them address small steps. Defining the policy mix is needed to implement pilot technologies in small farms. Moreover, strengthening their capacity to access small innovation grants will generate relatively small changes in their businesses.

Specific instruments need a specific approach to promote digitalisation and robotization of the agrifood sector. Training and consultations are essential to develop digital skills. So far, the agrifood sector has not used the available ICT support instruments efficiently, mostly due to the lack of awareness, capacity (consultant services) and funding.

There are still some structural bottlenecks that need to be addressed and cannot be solved in the short term. These include being stuck in the "moderate innovators" category, difficulties in cooperation between academia and business, delays in executing the managing process of Operational Programmes (OP) and the reduced capacity of agricultural SMEs to become beneficiaries in the EU-funded projects.

There are also significant administrative problems, which hinder both the performance of OPs managing authorities and the willingness of the individual beneficiaries from academia and industry to participate in the different instruments. The main difficulties include the lack of capacity to prepare public procurement documents, the difficulties of selecting a contractor, and the delays they could generate in the implementation of projects. Building capacity among the main target groups of beneficiaries could partially overcome these difficulties.

The effectiveness of the RIS3 policy increases the successful use of the funding instruments by the agrifood sector. However, local qualitative data showed low awareness and low capacity of the SMEs in the agrifood sector to participate in the open calls (insufficient human resources, lack of innovation, poor functional connection with R&D organisations, administrative obstacles, inability to provide co-funding). OPs provided significant support to the agrifood sector in some areas, but definitely proved more beneficial to other sectors.

There is also a gap regarding access to funding for medium-sized companies that are usually targeted by policy makers through support measures and R&D funds. Minor initiatives, such as innovation vouchers, cannot solve structural innovation challenges in regions, but can contribute to increasing awareness and running pilot programs. Major policies that increase the participation of companies must be improved based on such minor initiatives, and especially the experience gained by the agrifood sector in their course.

In the near future, countries that are moderate innovators take a risk when they hold fast to their unfavourable position caused by:

- ◇ slow progress in the implementation of national or regional strategic and operational RIS3 goals;
- ◇ significant regional differences and disparities in innovation activity and potential in different regions of the country, which hinder entrepreneurs' access to knowledge and technologies.

RIS3 output-related gaps

Innovation is the main concept promoted by the RIS3, and large amounts of funding were allocated to universities as hubs capable of generating research-intensive innovation. Analysing the output of the innovation projects funded under the RIS3 and the general challenges related to the necessary transformation of the sector could help understand the importance of policy making.

The first challenge in “selling innovation” is how to reduce the trust gap between RDI and agrifood companies, assuming that the service delivery process is well established within universities.

Connecting the RDI infrastructure with similar and complementary topics will help the scaling process of providing input to the industry. This could break the silos that remain in public research infrastructures and ensure a “no wrong door” policy for agrifood entrepreneurs. While achieving a critical mass of industrial contracts, this will help create use cases and further the specialization process.

The second challenge is to guide innovation solutions towards the new policy agenda where funds will be available. There are clear indicated needs in some countries and regions in combining actions focused on new policies (Green Deal, Climate Change, Circular Economy, Digital Agriculture), all being high RDI intensive, that need pilot and demonstrative examples. Furthermore, these RDI projects need to be translated into the market and tested for adoption potential beyond the technical demonstration.

The third challenge is to scale up activities and make innovation solutions openly available. Now, some regions claimed that there is too much focus on big farmers collaborating with public universities, and since innovative products and brands are usually developed by small innovative companies, it is not clear if this segment will have the same access to costly services.

At the operational level, it is challenging for policy makers to translate new technology-intensive concepts into RIS3 related calls to generate innovation outputs. The analysis has shown three “hot” topics, essential for the development of the agrifood sector and making it more innovative and connected to technology trends.

One of these “hot” topics is the traceability of agrifood products, which must be analysed in relation to the general adoption of ICT technologies. Within companies, traceability helps monitor production, increases costs savings, and improves food security processes. The untapped potential and value of traceability is outside the production line. When the product is on its way to the end user, it leaves a trace of data that is not yet exploited to its full potential due to low technology adoption and a lack of suitable business model.

For agrifood entrepreneurs, thinking out-of-the box about the entire value chain, in which data is integrated with the product, will be an important step. Furthermore, traceability could support a shift towards several value chains, in which traceability data, client experience, and interaction are embedded in their business model.

Finally, traceability is not just a value added service but it adds value to the product for the final consumer. It can have many possible applications, all of them promoting a form of innovation:

- ◇ increasing the exporting capacity and strengthening local brands from small countries or marginal regions;
- ◇ tackling counterfeits of well-known brands and products (e.g., DOC);
- ◇ genetic authenticity and micronutrient richness of organic products to define local products when building a brand;
- ◇ transforming products into brands, and brands into consumer trends through authenticity;
- ◇ treating data management and sharing within a value chain for transparency as common good that supports best marketing practices;
- ◇ interacting with customers, to create an emotional bond and gain market stability;
- ◇ connecting consumers to make them active innovators/actors/co-creators within the food chain;
- ◇ improving post-sale services;
- ◇ increase resiliency based on quick/real-time market information

Now, there are some concrete aspects to consider since traceability requires a technology shift and new processes within companies. The value of the product could offer a chance for traceability solutions, as already observed in the winemaking industry in well-known regions.

Fragmentation of the supply chain is surely another bottleneck. Small farmers cannot afford technologies when their upstream peers in the chain do not implement traceability. Farmers and producers have potential to produce, gather, and share data streams. This might help the next chains adopt and forward traceability practices closer to the end consumer.

The volume of data created by traceability processes might help individual producers manage their own niche, but it will quickly reach its growth limit. Using big data algorithms and machine learning requires upscaling data and creating new data value chains. This means that many agrifood actors will participate in the creation of the data stream.

Traceability can be extended from its own supply chain to several other value chains. Data can be collected during production using sensors and traced up to the end-customer experience.

Circular economy and sustainable practices are another example of a “hot” topic. The circular economy has been supported by the policy framework and by several projects, but is not yet widespread. It focuses on issues such as soil management, sustainable utilisation of bio-resources and waste, or biofuels.

While skills and technologies are already in place, circular economy still needs scalable models supported by use-cases and knowledge networks. Circular economy practices and resource stewardship must be integrated in business models beyond the existing prototype solutions. The diversity of agricultural activity and the production scale of several agrifood operations offers plenty of by-products that can be used for materials in other businesses.

Most of the existing circular economy projects are implemented by large companies. Such capacity is not available to small farmers. To make closed-loop activities relevant to minor producers, industrial proximity and logistics must be provided, supported by concrete use cases.

Circular economy cannot be managed by agrifood entrepreneurs alone, since it is very much dependent on business, natural resources and the other actors in the ecosystem. The closed-loop business is the challenge to which local innovation could respond and create a market, in which actors can act as part of an ecosystem.

Managing **entrepreneurship and talents** is one of the biggest cross-sectoral challenges in agrifood policy making. Accelerated

demographic decline and rural depopulation affect both rural countries and those that excel in innovation.

The prevalence of micro- and small firms, land fragmentation, ageing population, low skills and increased costs in agrifood production could cause the “perfect storm” even in strong agricultural producing countries. And we will all experience it daily on our plates.

New master’s degrees in university programs designed to attract talent to the sector with digital technologies, along with the ERASMUS+ initiatives, could alleviate the depopulation of rural areas. What are needed is regional programs directly addressed to harness the early potential for innovative entrepreneurship in the agrifood sector.

Already existing university acceleration programs around local RDI infrastructures could include: international mentorship programs, international reach and exposure, pilot programs outside the region to reach out entrepreneurial ecosystems outside its borders, etc. Young agrifood engineers could then learn how to conduct market analyses, present financial estimates, or pitch their products.

Without a critical mass of efficient producers and promising young entrepreneurs, private actors in business support environment might not see an opportunity to offer their services. This implies the lack of corporate venture capital for agrifood investments and reduced opportunities to raise money and reach knowledge and business networks. Private investors could help address issues related to patents, intellectual property rights (IPR), market penetration, or negotiation with larger industries. These aspects cannot be managed by start-ups on their own.

The agrifood sector that is technology-intensive in the entire value chain, potentially managed remotely and resilient to risks of climate change could be made “cool” again and attractive to young talents.

RIS3 agrifood policy needs

In the process of data collection (2020-2021), the national and regional experts offered support in several potential international initiatives. Four areas were identified to be integrated in the RIS3 policy process: products and services, RDI infrastructure, skills and entrepreneurship. The collected ideas are useful as a mapping tool and some of the needs can be easily transformed into local initiatives, policies or integrated in the existing RIS3 policy mix.

RESEARCH AND INNOVATION FOR PRODUCTS AND SERVICES

- ◇ Focusing innovation on shortening the supply chains, which could balance local and global production while triggering decarbonisation
- ◇ Organising knowledge transfer events so that traditional agrifood companies could meet agile IT companies
- ◇ Specific calls for innovation ecosystems to strengthen knowledge communities
- ◇ Specific calls for personalized and sustainable food production
- ◇ Pilot programs that lead to developing new digital products or services to mitigate adverse effects of climate change or actions that combine circular economy with green deal using digital technologies
- ◇ Support to food HUBs that focus on development of functional foods based on bioactive compounds from spontaneous flora and local genetic resources
- ◇ Support for conceptualization of agrifood innovation networks and hubs, supporting access to essential infrastructure
- ◇ Establishing global research networks that act as competence clusters
- ◇ International board of evaluators for project ideas
- ◇ One-month residencies for academic experts in agrifood companies
- ◇ Supporting the projects of entrepreneurs who develop projects on smart agricultural practices and smart cities

RESEARCH INFRASTRUCTURE

- ◇ Multidisciplinary research infrastructure with energy as a cross-domain topic, to develop bioeconomy and circular economy
- ◇ Innovation vouchers for companies to access open labs infrastructures
- ◇ Supporting agrifood labs that engage consumers and citizens to enhance their experience
- ◇ Innovation brokerage as a service for micro-enterprises in the agrifood sector
- ◇ Living labs, test-beds, tech-transfer and start-up incubation for small scale initiatives within research infrastructure
- ◇ International network of research infrastructures that provide testing opportunities for international start-up incubation and accelerator programs
- ◇ Support plans, programs and projects for post-production processes

ACADEMIC STUDY AND PROFESSIONAL TRAINING

- ◇ Improving professional skills in food engineering
- ◇ Promoting green procurement as a driver for cross-industry transformation of the sector
- ◇ New training programs focusing on aligning industry needs with new EU policies: climate change, digital agriculture, circular economy and Green Deal
- ◇ Professional training curricula on social farming, circular economy and sustainable diets
- ◇ Connect industrial clusters with university programs dedicated to young researchers and young entrepreneurs
- ◇ Improving entrepreneurial and managerial skills, equipping students to undertaking complex multidisciplinary tasks in the agrifood systems and to incorporate the minimum set of skills to facilitate the creation of technology-based start-ups
- ◇ Training programs on creative techniques to develop new products, processes and innovation

ENTREPRENEURSHIP SUPPORT

- ◇ Matching ventures with young green innovators/authors of best diploma theses
- ◇ Engaging with local incubators for small start-up food businesses and strengthening their capacity to deliver while maintaining compliance to the complex regulatory framework
- ◇ Introducing innovation vouchers as a simple tool to harness ideas and potential of young entrepreneurs
- ◇ Launching incubation programs for agrifood digitalisation, healthy products, or targeted foods
- ◇ Accelerator programs for mature, yet traditional agrifood companies, promoting the culture of innovation
- ◇ Accelerator programs promoting disruptive innovation in the agrifood sector
- ◇ Development of new start-ups addressing digital agriculture, climate change and green deal
- ◇ Implementing specific seed programs only for the agriculture and food sectors
- ◇ Raising awareness: hackathons, summer schools organized by universities, entrepreneurial boot camps, visits or open days to business incubators, investment forums, soft-landing schemes, demo days, special festivals

Challenges and solutions for successful implementation of smart specialization strategies (RIS3) in the agrifood sector

RESULTS OF THE POLICY GAP ANALYSIS

Approach and methodology

The input of this research chapter is the result of individual interviews with RIS3 experts from various European countries, supplemented by the analysis of available playbooks and guidelines for RIS3 practitioners in the European Union. The content is illustrated by selected case studies and examples of the RIS3 implementation process. The following is a list of experts who participated in this research:



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Independent S3 consultant
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Vice Rector for Science and Projects at Agricultural University-Plovdiv
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Kristina Sermuksnyte

Alesiuniene, General Manager at AgriFood Lithuania DIH
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Raluca Ioana Cibu Buzac

Founder and CEO at Luminspino
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Claudia Lentini

Independent consultant and expert
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Luis Goñi Navarro

Director of the Regional Strategy Area
(Spain)



María Ángeles Ruiz Ruiz

Agency of Innovation and Development of Andalusia IDEA
(Spain)

Additionally, hypotheses and findings were developed in cooperation with members of the EIT Food RIS Policy Council. A full list of the members of EIT Food RIS Policy Council is presented in Appendix 2.

The EIT Food RIS Policy Council is a policy advisory body consisting of stakeholder representatives from EIT RIS countries. The Council supports EIT Food in the policy dialogue and other interactions in the target countries. It contributes to the further development of EIT Food instruments and projects and works in partnership between government authorities and other stakeholders to synchronize the development of the EIT Food portfolio with national or regional Smart Specialization Strategies (RIS3) of the targeted EIT RIS countries.

Systemic challenges and funding architecture

Our experts identified that stakeholders responsible for the implementation of Smart Specialization Strategies (RIS3) encounter various challenges regarding the systemic design of RIS3. These are:

- ◇ High level of bureaucracy, prolonging the process of applying for funding. At the same time, potential beneficiaries see timing as a key to the successful implementation of innovation. Therefore, the money should be allocated efficiently, without unnecessary delays.
- ◇ The need to implement flexible rules for spending, i.e. a shorter funding period, can help to overcome the problem of timing in the innovation process.
- ◇ Competition for adequate focus and priority between RIS3 as a long-term perspective strategy and short- and mid-term strategies created during the COVID-19 pandemic, or as a result of the outbreak of war in Ukraine. Additionally, current problems with insufficient human resources are another context of the problem of workforce allocation.
- ◇ The need to differentiate and adequately describe RIS3-related projects that must also be inspiring for business and political actors compared to new initiatives such as the New Generation Fund or Recovery and Resilience Plans.

At a different level, the implementation of RIS3 can be challenged with regard to funding architecture (linking grants with opportunities offered):

- ◇ Representatives of the agrifood sector prefer to apply for rural development funds that provide operational support for their business, but do not encourage them to undertake innovative projects and activities.
- ◇ RIS3-related funds are relevant primarily to agrifood representatives who focus on secondary food processing. The money supports funds for their expansion to new markets and the development of new innovative products. However, the RIS3 funds for agrifood innovation are less relevant to primary food producers and farmers, as most of them do not recognize the potential and long-term benefits of adopting the innovative approach, processes, and business models.
- ◇ Government incentives to encourage individual farmers or small businesses to implement digital solutions are still insufficient. Current incentive levels are not functional in terms of the potential generated for beneficiaries interested in participating in RIS3 related projects.
- ◇ What could be beneficial in the process of designing funds for agrifood stakeholders is dialogue with potential beneficiaries to identify key incentives that could be included in the process.



Cristian Sorin Gotia Cretiu
Independent consultant

ROMANIA

The last three years have shown the fragility of our agrifood ecosystems against unexpected shocks. The standard EU policy making, covering the seven-year programme period, worked well under normal conditions, but now the mechanism had to quickly respond to structural effects. From a policy perspective, the concept of resilience includes the ability to quickly react to unexpected shocks to ensure business continuity. It also means the ability to prepare for well-known long-term challenges: demographic winter, climate change, intercontinental technological competition, or energy crisis.

In this landscape, innovation remains the constant factor. It helps agrifood stakeholders expand their market, integrate digital technologies into their processes, and adapt sustainable and circular practices for increased resiliency.

Europe has the advantage of promoting the cross-sectoral innovation policy under the concept of Smart Specialization Strategy (RIS3). It offers a focused perspective to support action while supporting a large

ecosystem of networks and programs. Consequently, it is essential for agrifood stakeholders to take advantage of the framework and empower them in policy implementation, project development, and as members of the knowledge networks and sustainability promoters.

Now, the cost of nonaction is higher than ever, which will be reflected in funding mechanisms that will directly affect those who do not understand the policy shift.

And it is not just about complying with the policy trends, as there are clear signs that leading market players and consumers are heading towards sustainability as defined by the sustainable development goals (SDG). Running an innovative, resilient, digitalized, circular business will not only create more value, but also capture interest of private investors or specialized VCs that will further strengthen innovation.

While cryptocurrency is collapsing, there is a lot of untapped potential for the agrifood sector to grow. Finally, we are advocating for agrifood stakeholders to join innovation in all its dimensions to ensure a sustainable future.

Building dialogue with regional policy makers and choosing the right priorities can sometimes mean operating under pressure from politicians, who push for more priorities and opening doors to more companies. This can result in choosing priorities based on wishful thinking and focusing on the capacities that regional authorities would like to have in the future, rather than actual capacities of the region. Some of the solutions on how to handle this challenge are listed here:

- ◊ Using and communicating the benefits and potentials of the entrepreneurial/open discovery process to various groups of stakeholders (i.e. policy makers, business representatives, R&D institutes).
- ◊ Building rationale based on mapping capacity and assets to support the selection of priorities.
- ◊ Regularly discussing priorities with local politicians to build understanding and political support.
- ◊ Following the guidelines of the Partnerships for Regional Innovation Playbook (PRI) with respect to monitoring and evaluation of regional RIS3 policies and programmes in an open participatory mode, which includes relevant stakeholders of the process.

Understanding the regional ecosystem and potential

TOWARDS OPEN AND PARTICIPATORY PROCESSES

In the mapping of regional capacities and assets during the entrepreneurial/open discovery process, the challenge is to find the right balance between the capacity and assets of the region and market opportunities. In addition, it is also important to consider the political pressure to expand the priorities. During the research, the following solutions were raised:

- ◊ In each RIS3 strategy, the regional character or features of the ecosystem and its stakeholders should be considered to understand the needs and expectations of the local community.
- ◊ Understanding and mapping local capacities followed by comparing them with needs and opportunities on the market, in particular sub-sectors of the agrifood industry.

- ◊ Asking participating stakeholders to contribute at different points of the action plan – regarding both tangible and intangible assets. This allows to narrow down priorities in accordance with the possibilities of the region and to identify potential consortia of diversified entities that could cooperate and run a pilot project.
- ◊ Mapping available tangible assets can also save time in raising additional funds for goals that are within the partners' capabilities or reach.

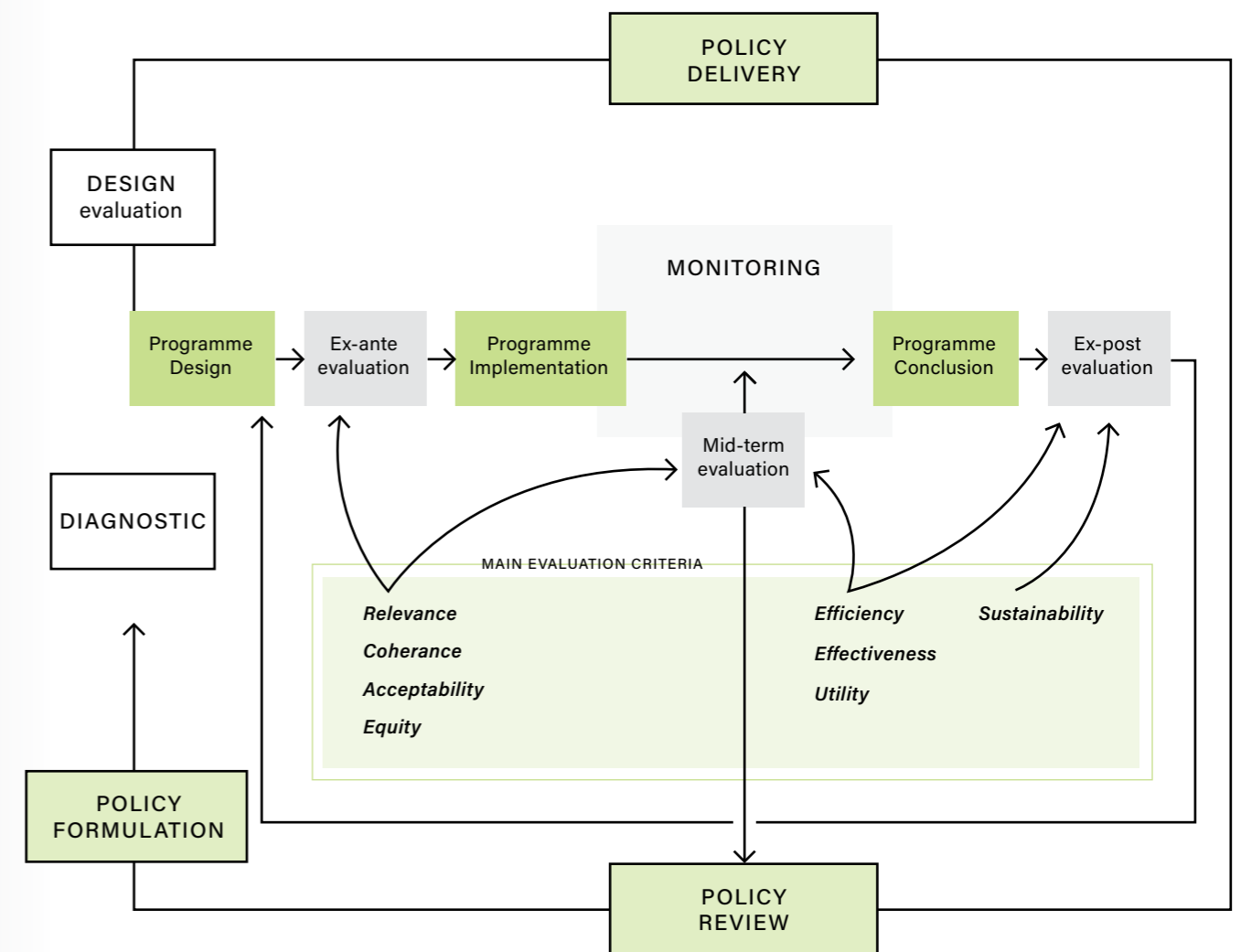


Fig. 8. Monitoring and evaluation system in the PRI policy cycle.²⁰

²⁰ D. Pontikakis, I. González Vázquez, G. Bianchi, M. Ranga, A. Marques Santos, R. Reimeris, S. Mifsud, K. Morgan, C. Madrid, J. Stier-na, Partnerships for Regional Innovation – Playbook, Publications Office of the European Union, Luxembourg, 2022.

Every initiative needs its ambassadors and leaders. While working on RIS3, there is a need to combine political leadership with business leadership. The stakeholders involved must be willing to invest their time and commit to the effort. That is why identifying the leaders in the industry, entrepreneurs, and scientists who can push the project to the next level and who are willing to tackle local challenges is critical.



Partnerships for Regional Innovation Playbook

Partnerships for Regional Innovation (PRI) aspires to become a strategic framework for innovation-driven territorial transformation, linking EU priorities with national plans and place-based opportunities and challenges. It primarily aims to improve the coordination and directionality of regional, national and EU innovation policies to implement Europe's green and digital transitions and to tackle the innovation divide in the EU.

Link: publications.jrc.ec.europa.eu/repository/handle/JRC129327



Ioannis Spandos
Coordinator of the Joint Secretariat CP INTERREG V-A "Greece – Bulgaria 2014–2020"

GREECE

The EDP as a continuous process provides extremely valuable results as the social and economic environment changes quickly (especially with regard to innovation). It allows stakeholders to discuss issues as the final implementation of the policy instruments approaches and not only in the early and strategic stages. This creates a "cooperation momentum" at the call and builds systemic trust.

The barrier to the process is the willingness of the ambassadors and leaders of each ecosystem to participate in the continuous EDP process. However, the key to overcoming this issue can be addressed by establishing an initiative to support the ecosystem of innovation and entrepreneurship.

Communication of RIS3 programmes

TO POTENTIAL BENEFICIARIES AND STAKEHOLDERS OF THE PROCESS

One of the key challenges in popularising Smart Specialization Strategies (RIS3) and its opportunities for stakeholders is the lack of inclusive language in RIS3-related content. Most of the materials are aimed at policymakers with marginal focus on evangelisation among potential participants and beneficiaries. The terminology and phrases used for the purpose of RIS3 and the granting procedure are incomprehensible for applicants from the agri-food sector. To overcome those problems, officers and institutions responsible for communication about RIS3-related projects should consider:

- ◇ Stepping into the role of a translator, who translates complex RIS3 issues into a language of process and benefits that potential stakeholders can understand. In some cases, relevant messages should be matched with specific stakeholders (i.e. R&D centres, Start-Ups, Large Companies and last but not least Farmers).
- ◇ Creating materials that would explain the main purpose, objectives, and goals of the Smart Specialisation Strategies (RIS3) to organizations unfamiliar with the topic.
- ◇ Providing glossaries of RIS3-related terms.

Another barrier is the limited access to information about available funding. Target stakeholders often lack awareness about possible funds and programmes that are available to innovators in the agrifood market. Those who have basic awareness about such possibilities have limited understanding of the relevance and eligibility criteria involved in specific grants and programmes. Therefore, communication about programmes and funding opportunities seems to be of key importance. This could be done through:

- ◇ Promotion through regional administration (a regional approach is key as the targeted stakeholders operate in the region),
- ◇ Setting up physical regional hubs and regional centres to provide adequate information to potential beneficiaries,
- ◇ Financing stakeholders from different operational programs, i.e. rural development programs or national innovation funds, to build a single point of contact for various funding programmes,
- ◇ Promoting a model of public-private partnership to supply stakeholders with information (example from France - Arvalis; see case study).

Institutions providing assistance and know-how regarding smart specialization strategies (RIS3).

Institution or type of organization	Description
JRC SMART SPECIALIZATION PLATFORM Link: s3platform.jrc.ec.europa.eu	<ul style="list-style-type: none"> ◇ The main source of information on methodology, ◇ Database of national/regional strategies ◇ Case studies of implementation of the RIS3 strategies. ◇ Peer-review sessions and contact information to certain regions or local partners ◇ Tools enhancing inter-regional cooperation.
REGIONAL DEVELOPMENT AGENCIES	<ul style="list-style-type: none"> ◇ Source of information on programmes, financial instruments and trainings offered in particular regions ◇ Information about intra-regional and cross-regional networking events ◇ Technological infrastructure offered by the agency ◇ Opportunities for cooperation in frameworks for private business, institutional, trade union, and academic members.
SECTORAL CLUSTERS AND CHAMBERS OF COMMERCE	<ul style="list-style-type: none"> ◇ Opportunities for networking within sectoral specialisation ◇ Information about match-making events, source of practical know-how for SMEs ◇ Opportunities to synergise costs, buying goods and services for a larger group of enterprises.

Another important element in the landscape of communication about RIS3-related projects and experiences is the provision of platforms to transfer knowledge and practices between regions. Often, there are similarities between regions and their programming lines, and interregional cooperation should be considered to both thematic problems or systemic challenges. Therefore, mapping of regions should be considered to develop synergy and cooperation possibilities across regions. This activity is especially useful at the regional level to identify other EU regions as peers with the highest potential for synergy and cooperation within complexed value chains (i.e. rice production or cocoa products).

CASE STUDY

Arvalis (France)



ARVALIS - Institut du végétal - is an applied research institute dedicated to arable crops. It provides references, innovations, supports and advice to farmers and agricultural sectors. The ARVALIS mission is to capitalize on its experience to enable and support the development and adoption of farming techniques and systems that reconcile precision, high performance and sustainable agriculture in all territories of France.

Its main objective is to reconcile the following factors:

- ◇ economic performance (productivity, profitability, competitiveness);
- ◇ suitability for markets (food and feed, bioenergy, biomaterials, etc.) in France and abroad;
- ◇ resilience to changes (regulatory, economic, social) and to climatic hazards;
- ◇ positive contribution to environmental issues (reduction of inputs, water saving, carbon storage, biodiversity enhancement, ecosystem services).

The Institute offers training courses and releases information through the press or its own media and information services. It also contributes in its social networks, information meetings and conferences, brochures and flyers. It also makes available decision-making support tools for crop management to farmers and agricultural technicians.²¹

²¹ Source: Perspectives Agricoles, ARVALIS Terres Inovia infos, www.arvalis.fr.

Building innovation capacities and transferring knowledge among stakeholders

Building the capacity of people in the agrifood industry is an important element in building the effective innovation ecosystem. However, the greater socio-economic phenomena should also be considered. One of those is the challenge of stopping the general tendency of young people to move away from agricultural jobs. This phenomenon is also connected with the cross-European trend of rural depopulation. Some of the solutions to this problem involve education programmes and launching broad communication targeting students and graduates coming from rural areas - examples:

- ◇ Raising the attractiveness of the agri-food sector, e.g. by regional hubs and education centres to build capacity, funded by R&D operational programmes.

- ◇ Involving PhD students in RIS3 projects, which is also a benefit for large companies participating in the projects, as it allows them to reach young talents, especially in life-sciences.
- ◇ Possibly involving high schools (teens between 14 and 18 years of age) to boost interest in food technology and agriculture.
- ◇ Promoting a culture of cooperation among students.

The RIS3 funds can help in the development of new model research and education infrastructures (e.g. research centres, technology centres, living laboratories and regional clusters, flagship biorefineries for demonstration projects) at a national level, where capacity building should be provided by using multi-actor approaches. These initiatives would help foster national bioeconomy research capacity, including a new food system transformation approach, by combining regional resources with technological areas such as microbial production, enzyme technology, green chemistry and advanced physical and chemical processing.

RIS3 could provide funds for restructuring and mobilisation of the regional bioeconomies to accelerate at national and regional (NUTS 2 and NUTS 3) levels and at the rural level. This could be facilitated by the development of combined funding instruments (e.g. the Rural Development Programme) to support rural regional recovery and just transition funds to support deployment of innovation and collaboration amongst bioeconomy actors.

CAPBIOBG²² in Bulgaria is an example of capacity building. It is an impactful collaborative initiative aimed at boosting the regional innovation potential in Bioeconomy and strengthening the capacity of AUP to develop and implement research & innovation projects in bioeconomy. It brings together the Agricultural University of Plovdiv (AUP) in partnership with Wageningen University, Wageningen Research, BiOrbic Bioeconomy SFI Research Centre Dublin, University College Dublin and the University of Bologna. It promotes systemic and integrated approaches to acquiring research knowledge and innovation in the field of bioeconomy and Food systems. The capacity building of AUP is the key project goal, also because the AUP is a coordinator of the consortium EIT-Food Hub Bulgaria. An additional objective is to promote multi-actor and multidisciplinary collaboration in research & innovation as a key prerequisite for implementing regional strategies on bioeconomy in Bulgaria and in AUP.

²² More information: <https://capbio4.bg/html/en/>.



Prof. Vladislav Popov, PhD
Vice-rector for scientific and project activities of the Agricultural University of Plovdiv (AUP)

BULGARIA



The importance of capacity building is even more relevant for another important group - potential beneficiaries of RIS3. In expert opinion, there are not sufficient entrepreneurial skills in recent graduates and staff in research institutes. Also, entrepreneurs and farmers lack the understanding of EU policies, fund schemes, key trends, technologies, and know-how regarding methods of business model transformation. Some of the challenges can be addressed by the following:

- ◇ Cooperation with educational institutions to build an educational and training ecosystem for RIS3 stakeholders which would feature hard skills related to agrifood innovation and bioeconomy and also soft skills. Training programmes must be designed for and focussed on diverse target groups, including entrepreneurs (startupper), farmers, young graduates, and researchers,
- ◇ Cooperation with companies to invest in and support their internal experts (i.e. food processing engineers and managers responsible for implementation of bioeconomy practises) to further develop their skills and to incentivise them to stay in the industry,
- ◇ Establish dedicated Committees within the regional innovation ecosystem (i.e. in Regional Development Agencies or within bodies of Regional Governments) to deal with HR topics and expert development.

Professional skills are also crucial among representatives of government entities which are important stakeholders in the agrifood innovation ecosystem. Building capacities is needed to coordinate and prepare Smart Specialization Strategies (RIS3) and their implementation.

Moreover, designing calls linked to Smart Specialization Strategies (RIS3) requires vertical expertise or at least experience in implementing models of cooperation with vertical experts. One of the solutions to this challenge is a model of building a network of experts to work in thematic, vertical groups. Their support is especially important in such activities as advisory services or call development support.

To speed up and increase the efficiency of the process implementation of innovations there is a need for knowledge transfer from more experienced countries. However, policies regarding implementation of Smart Specialization Strategies (RIS3) sometimes prioritize usage of exclusively regional ecosystems and capacities which results in hindered knowledge transfer between champions and moderate Innovator's regions. The challenge of institutions responsible for implementation of RIS3 is to find the right balance between promoting regional capacities and sourcing from outside to provide an innovative breakthrough.

Cross-regional and cross-national cooperation has a crucial role in transferring knowledge and innovations. It is especially important for small countries such as Lithuania. The Lithuanian food and beverage sector significantly contributes to Lithuanian economy. The local market is too small for large and medium size companies, and this is why 50% of production is exported.

Therefore, companies must be very innovative to compete successfully in international markets. Lithuanian food sector has a broader range of products, i.e. meat, dairy, chocolate, bakery, frozen food products, as compared to, for instance, Spanish market where the main focus is on wine, olive oil and meat production sectors.

Most Lithuanian food scientists are not strongly specialised as Lithuania is too small for such specialisation. However, companies require and expect to gain specific knowledge and experience from those scientists and experts to improve their production. Dairy producers, for example, appreciate that Italian scientists have more experience in dairy production as this sector is huge and strongly developed in Italy. Chocolate producers understand that Belgium is an expert in chocolate production. Lithuanian companies hold frequent discussions with these experts, receive proposals for cooperation from them yet a large investment is often the main problem upfront.

The financial support from European Union could be an option to encourage cross-national cooperation as local Lithuanian innovation programmes are mainly prepared to support cooperation between Lithuanian companies and Lithuanian scientists or universities. Lithuanian universities have the opportunity to collaborate with foreign partners, however, the financial interest is to involve local scientists and implement projects using their own resources.

In summary, companies, especially in small countries, understand the importance of cross-regional and cross-national cooperation for the transfer of knowledge and innovations. Unfortunately, actual financial support instruments are missing to encourage cooperation with foreign innovation experts or scientists. At the moment, most programmes are designed to promote cooperation inside the country, but not at the cross-national level.

The largest companies are flexible and can invest their own funds to attract the best foreign experts. On the other hand, small and medium enterprises are unable to invest heavily which limits their choice of experts. On many occasions, companies decide to work using their inhouse resources and without involving local scientists. The latter usually lack the specific and/or niche experience companies expect or need.



Giedrius Bagušinskas
Lithuanian food exporters association (LitMEA)/SMART food cluster
LITHUANIA

The role of governance in RIS3 projects

One of the key challenges in governing the (RIS3) design is to ensure the effective level of participation from business stakeholders. Based on the expert interviews, it was found that business stakeholders responsible for applying and participating in RIS3 initiatives do not understand the overall concept of Smart Specialisation Strategy (RIS3). This is often the case because they did not participate enough in the design process of RIS3. It is also a challenge to find business representatives who have enough motivation and time to participate in the design process. Business representatives realise it is a very long and time-consuming

process. In many cases, companies do not understand why their voice is important in the policy design process, since they do not see how their impact can be relevant for policy making.

One of the solutions to this problem lies in engaging intermediary actor: an innovation broker. Innovation brokers are essential to procure innovative goods and services by linking the demand from buyers with the

innovation capacity of suppliers. Innovation brokers can help buyers identify their needs and connect them with the start-ups and SMEs that are able to develop tailored, innovative solutions for them.

In addition, innovation brokerage includes giving advice on project development, encouraging unconventional thinking, searching for potential innovation partners ('matchmaking'), promoting focused knowledge transfer and increasing information sharing.

Innovative solutions are needed in the current competitive and digital world. Unfortunately, businesses often lack the knowledge

to address problems or know their options. Innovation brokers can fill that void with their expertise in matching these innovation needing companies with the right institutions that can provide them with a tailored solution²³.

²³ Source: <https://ied.eu/project-updates/what-is-an-innovation-broker-and-what-does-it-do/>.



Knowledge and innovation play a crucial role in helping farmers, foresters and rural communities meet current and future challenges. To ensure that knowledge is shared between everyone who uses and produces it and that people are connected, effective agricultural knowledge and Innovation Systems (AKIS) are needed across Europe. (European Commission 2021, EIP AGRI Seminar)

Agrifood is an economic sector which is integrated for a high number of individual producers and small and medium enterprises. The implementation of innovative solutions requires the assistance of Innovation Support Services (ISS) (ex. Innovation brokers) to link actors and to "translate" the needs of producers to the researchers and policy makers. The assistance is also necessary to detect, show and share previous successful experiences of other producers, start-up bottom-up solutions with a multi-actor approach (MAA). Any RIS3 initiative might be aligned with both of these concepts.

Given the special characteristics of the agrifood sector and its great atomisation, the role of the AKIS or ISS takes special importance to strengthen the innovation and the knowledge transfer. This is possible through different functions such as Demand articulation, Exchange of knowledge,

Advisory, Networking, Capacity building, supporting access to financial resources to innovate, Institutional support for innovation, and scaling the innovations.

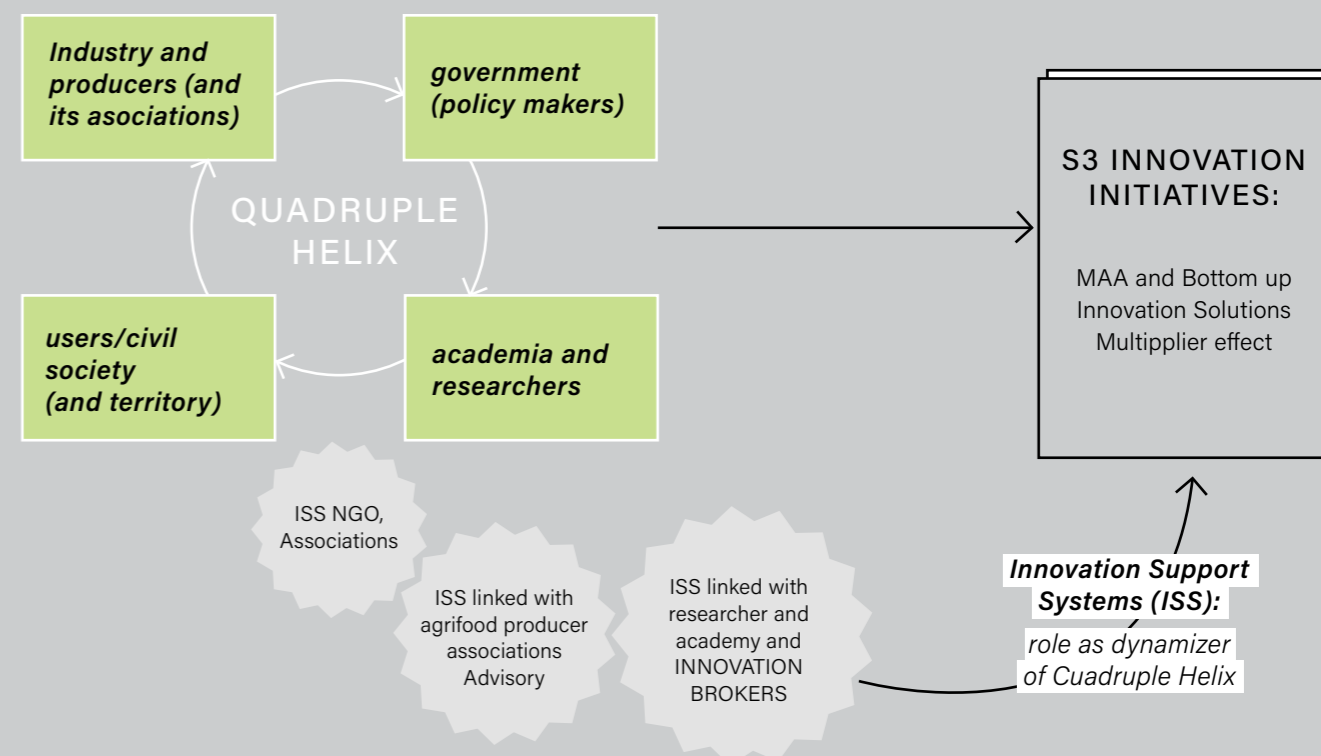
To categorize the agrifood support system, on the one hand it is crucial to take in account the existing entities active in this sector: as producer groups (cooperatives, organisations of producers, Regulatory councils of quality food schemes, etc.) or other complementary sector (ex. suppliers). Moreover, the role of other associations, NGOs, or the rural territorial organization such as the Local Action Groups should not be disregarded.

On the other hand, it is important to recognise structures linked to universities, the research centres, or specialized instruments: as a relevant successful case of the Andalusian region, the Agrifood Campus (ceiA3) (recognised in the Andalusian S4 as a relevant and strategic innovation instrument for the Andalusian agrifood sector) can be cited.

All those agents (ISS) play an inestimable role in the dynamization of innovation ecosystem and reinforcing the quadruple helix. They could be key instruments to be taken into account to design, start-up, disseminate, dynamize, execute and communicate the RIS3 projects and to reinforce its multiplier effect.



Lola de Toro Jordano
ceiA3 General Manager
SPAIN



Another solution to the problem of stakeholder participation lies in a well-designed governance model, the distribution of roles, and the appropriate process and tools for the participation of regional stakeholders.

Effective governance model can be implemented by creating two types of bodies cooperating with each other, having diverse aims and responsibilities. This model seeks to introduce effectiveness from synergy between diverse competences, aims and backgrounds of the members involved. The competences and aims of those groups can look as follows:

Steering Committee – administration responsible for finding and allocating financing, writing public calls, the leading power of political buy-in. Providing a horizontal perspective, taking strategic decisions in cooperation with Working Groups.

Working Groups for each innovation field – expert-based innovation labs preparing foresight, supporting Steering Committee with vertical knowledge, exploring needs with the most important stakeholders for each thematic field.

The case study below presents an example of the process implemented in Andalusia (Spain). The detailed elements of the governance model were a subject of a study in the handbook called *Implementing Smart Specialisation Strategies* prepared by experts from JRC, the Smart Specialization platform²⁴.



24 C. Gianelle, D. Kyriakou, C. Cohen and M. Przeor (eds), *Implementing Smart Specialisation: A Handbook*, 2016. Source: https://s3platform.jrc.ec.europa.eu/documents/portlet_file_entry/20125/Implementing+Smart+Specialisation+Strategies+A+Handbook.pdf/9440b855-4f44-a75a-9c9b-a1f-71c3e201e.

CASE STUDY

The governance and process of the entrepreneurial discovery in Andalusia (RIS3 Andalusia 2014-2020, Spain)

The Regional Government of Andalusia believed that gathering the commitment – from the very beginning – of the stakeholders involved, especially from companies, was the key to ensure the success of the process. In 2012, the Andalusian Regional Government started with the development of the RIS3 Andalusia under the following fundamental principles:

- ◊ To direct economic policy and mobilise public and private investment towards innovation-based development opportunities;
- ◊ To discover and exploit strengths and opportunities for specialisation and excellence in Andalusia;
- ◊ To involve universities and regional actors in innovation, including the civil society, as the main driving force for structural change in the Andalusian economy.

Once the Council of Regional Ministers of Andalusia launched the RIS3 design process in December 2012, the Economic Policy Commission (the regional competent body that assumed the political leadership of the process) appointed the members of **the Steering Committee**.

The **Technical Secretary** of the RIS3 was the Agencia IDEA tasked with issuing all the working documents. It also **coordinated a task force involving technical staff from all the regional ministries participating at the Steering Committee**. This organizational design would guarantee interdepartmental

coordination and coherence among all the regional strategies that were being developed in the region for the frame 2014-20.

In order to create the RIS3 Andalusia, expert panels – which accompanied the Technical Secretary during the entrepreneurial discovery process – grouped 70: 30 from technology and competence centres, universities, public agencies, science and business parks, and 40 from individual companies.

Three rankings were defined to ensure the companies would be selected transparently: one for start-ups, one for SMEs and one for big companies. In each case, the following three criteria were imposed:

- ◊ the development of innovation projects in Andalusia;
- ◊ the technical assessment in the frame of European funded calls for innovation projects, over the previous 5 years: 7th Framework Programme for Research and Technological Development (7FP) and national and regional calls co-funded by European Regional Development Fund (ERDF);
- ◊ the score of each company was calculated by adding the add-valued of the project in terms of the impact generated, measured by the incentive obtained and the total investment mobilised.

Based on these three rankings, the best 40 companies were invited to participate in the Group of Experts. From this selection, the first eleven were appointed as **members of the Reference Group** to co-lead the process and have the same decision power as the Steering Committee.

Once this governance was established, all the working documents elaborated by **the Technical Secretary** were submitted to the different bodies using a dedicated web platform. All experts on the panel were actively involved in this mission and amended and documented the drafts.

The first document was the Regional Innovation System Analysis and its Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis. This document was approved separately by **the Reference Group** and **the Steering Committee**. Hereafter, the two bodies were merged into one: **the Co-decision Committee**.

Once the governance structure was established, stakeholders were engaged in proposals of specialisation opportunities for research and innovation in Andalusia. To avoid preconceived approaches such as sectors or clusters, an open questionnaire was distributed to experts together with an invitation to the RIS3 launch meeting.

The purpose of the questionnaire was to map the existing assets, resources, business capacities, and knowledge in the region.

All the answers provided by the experts to the questionnaire were the first inputs to the discovery process. Thereinafter, **the Technical Secretary** analysed, interpreted, and documented the results, interconnecting them, and organising six entrepreneurial discovery workshops (ED workshops) to address the identified themes together with the experts. Based on the results of the questionnaire, the objective of these ED workshops was to discuss and vote on the initial ideas of the experts in terms of areas of opportunity for specialisation.

The experts voted on the possible impact of each opportunity for specialisation taking into consideration the following factors:

- ◊ opportunity in the Andalusian GDP;
- ◊ opportunity in the regional internationalisation;
- ◊ opportunity in job creation.

The consensus among stakeholders engaged in the EDP was agreed when setting the so-called Vision. To this end, **the Technical Secretary** of the RIS3 submitted to experts a “cloud of tag” including terms frequently used during the working sessions of the process. **The Technical Secretary** asked the experts to vote on the terms – according to their relevance as an opportunity for specialisation – and to add as many terms as they considered necessary. Experts carried out this exercise on the web platform and its result was considered very revealing. Furthermore, when **the Co-decision Committee** approved the Vision, the result of the exercise was used as a filter for the selection of the regional priorities.

The results of the meetings and the ED workshops were completed with internal work involving an in-depth study of each of the proposals made. The proposals were documented, incorporating appropriate technical and statistical support, analysing their relationship with the priorities established in the Horizon 2020 European Framework Programme for Research and Innovation.

This stage of the process was supported by specialists expressly brought in for each environment created, with the support of **the Spanish R&D&I network**, and **the Technical Team of the Strategy**. This work was contained in the Catalogue of Specialisation Opportunities in Andalusia. It is a document compiling 68 opportunities, reviewed by the RIS3 Andalusia group of experts, validated by **the Joint Decision-Making Committee** and subject to public examination²⁵.

25 I. Perianez-Forte & C. Navarro, *Bridging the gap between science, market and policy in Andalusia*, 2016.

Collaboration between stakeholders in innovation projects

Another important area in the governance of the implementation of RIS3 is orchestration of collaboration between stakeholders. In the study, the challenge related to the phase of go-to-market of innovative ideas and products was mentioned as the most relevant. Some good projects do not have a continuation on the market. This is the case when a university creates a technology which is not ready and scalable to implement it in the market. The reasons can be numerous; however, the most common are lack of human resource or capacities (no specialists who have adequate skills); the final product is not 'market ready'; the costs of commercialisation of the solution are too high. It happens when there is a lack of communication and cooperation between researchers who work on innovations and businesses who use, implement, or commercialise them.

In some cases, the problem can be risk aversion and lack of openness to enhance innovation in the business model of food producers. Most representatives of food producers prefer to sell the product without adding extra value. It is easier for some of them to sell commodities with lower margins than trying to implement innovations that could bring extra value to the product. Some of the agri-food companies may be keen to observe and learn from experiences of other companies, but they lack time or funds to do it on their own. However, they are willing to join larger projects led by large and well-established food and retail groups.

To some extent, the solution to this challenge lies in education and ongoing training. The envisioned cooperation between companies, universities, and venture capitalists could improve access to potential capital. It would also be a chance for the agrifood business to gain soft skills and methods for managing innovation.

From the perspective of the officer responsible for RIS3 implementation and design of the programmes and funds, it could be beneficial to better assess the needs of business, i.e. food processors which are core of the value chain, and crucial stakeholders. In the next step, it would be valuable to add other stakeholders e.g. farmers and primary food producers. Finally, when considering the needs of business stakeholders, it is helpful to map the needs of retailers and food exporters.

Recognising the importance of third sector

A representative of civil society, the third sector should be regarded as a new and important stakeholder. At the same time, innovation should be considered a common good for society. The dissemination of a culture of innovation should start to focus on citizens. Implementing RIS3 should bring the innovation culture and its benefits not only to innovators, but also to the local communities.

That is why using the social capital of local communities is necessary to promote innovation in agrifood. In return, the development of innovation in agrifood should improve the level and quality of life of societies. To use this potential, some of the ideas and solutions were mentioned in the study: Creating a platform for stakeholder engagement.

Using NGOs as gatekeepers; as a proxy to local community and smaller entrepreneurs, farmers; as entities that are exploring the needs of society, organising events, sharing the power of innovation with citizens and helping them understand its benefits.

Building innovation capacities of local communities through cooperation with NGOs by education, training, pilot projects.

CASE STUDY

The Catlabs Network (Catalonia, Spain)

With Catlabs, Catalonia seeks to build the first prototype of a universal innovation regional system in the digital era. Catlabs is a research and innovation programme funded by the Regional Innovation Strategy, RIS3CAT. As a research programme, its main goal is to explore how the collaborative hypothesis can be tested. The way to do it is by building a network open to all citizens with a structure of three levels:

- ◇ a selected network of highly specialised and excellence research laboratories open to the world,
- ◇ a network of intermediate advanced laboratories,
- ◇ a wide distributed network of citizen labs.

This structure would be similar to the structure of European universal health care systems that cover the population.

The collaboratory should focus on societal complex challenges that require collaborative innovative solutions from quadruple helix (4H) stakeholders. Complex challenges require systemic innovation.

Catlabs is not only an innovation project. It is at the same time a research programme with theoretical hypothesis that should be elaborated and tested. The main hypotheses based on the Catalan roadmap are following:

- a. Catalonia can design and build a universal innovation ecosystem by combining its current research and innovation institutions with a new generation of open innovation and research laboratories (fablabs, living labs, citilabs, etc.). The first assumption is to recognise that every citizen can participate and become a member of the Catalan innovation system.
- b. Catalan strength is in its people. A citizen-driven innovation model needs to combine bottom-up and the top-down approaches. An innovation partnership between regional and local administrations is a necessary prerequisite.
- c. Catalonia can be an example of the complementarities and synergies among the EU Structural and Investment Funds, Horizon 2020 funds and other sources of financing (like crowdfunding) to implement RIS3 in Europe²⁶.

²⁶ Ibidem.

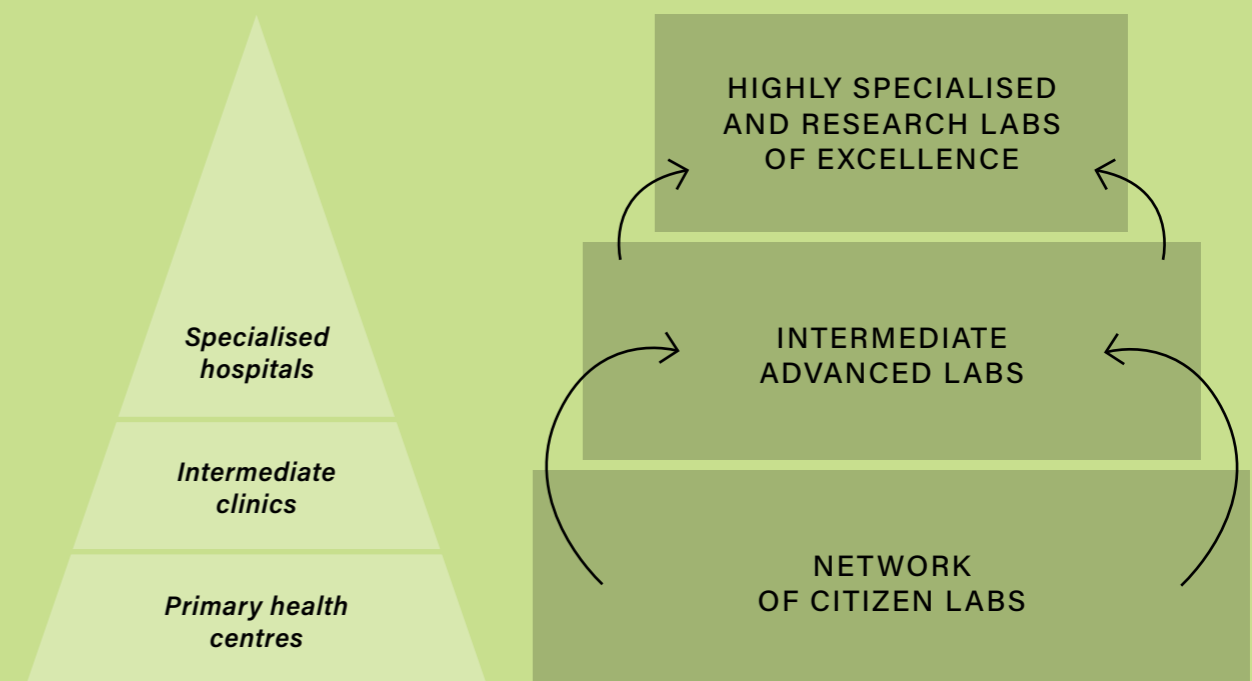


Fig. 10. Catlabs Network model.²⁷

²⁷ A. Serra & T. Fernández, Catlabs as a Collaboratory: a prototype of a universal innovation system in the digital era, 2017.

Establishing success indicators of RIS3 implementation

One of the outcomes of the expert study was the subjective list of RIS3 implementation success indicators. The list can serve as a source of inspiration and ambitions to identify the specific impact at different levels of execution. At the macroregional or national level one can place scores and indicators that are used by European Commission (European Innovation Scoreboard) and data analysed and visualised by Joint Researcher Centre (TEDv) to identify the level and progress in achieving innovation by particular regions or countries. Those EU macro-level indicators are useful for analysts and policy scientists to identify the policy mix and practises that can result in progress or decline in overall level of innovativeness.

◇ **European Innovation Scoreboard** provides a comparative analysis of innovation performance in EU countries, other European countries, and regional neighbours. It helps countries assess the relative strengths and weaknesses of their national innovation systems and identify challenges that they need to address,²⁸

Link: ec.europa.eu/research-and-innovation/en/statistics/performance-indicators/european-innovation-scoreboard/eis

◇ **Regional and National macroeconomic indicators**, Territorial Economic Data Viewer (TEDv) can be used as a source of information for more granular level of indicators and ad hoc analyses performed by RIS3 analysts. Among relevant information, one can find i.e. share and size of investments in R&D, number of new jobs created in particular countries and regions.

Link: s3platform.jrc.ec.europa.eu/synergies-tool

²⁸ https://research-and-innovation.ec.europa.eu/statistics/performance-indicators/european-innovation-scoreboard_en

From the perspective of analysis and evaluation of particular RIS3 funds or programmes in the region, relevant institutions can analyse various information: starting from microeconomic, obtained from companies that directly or indirectly benefited from RIS3. To some extent, information about the condition of the companies can also be collected in cooperation with sectoral clusters and chambers of commerce.

Information about the condition of companies that benefited from RIS3 programme:

◇ **Micro-economic indicators of economic condition** such as boosted profitability rate, market share, turnover of beneficiaries derived from questionnaires, financial statements or census data,

◇ **Expansion at the international market** derived from questionnaires and (in some cases) from sectoral clusters or chambers of commerce,

◇ **Number and share of SMEs that are implementing innovative technologies and sustainable activities.** Set of sustainable activities involved in the project compliant with **EU Taxonomy. Furthermore, policy makers can evaluate the impact of innovation policies with Smart Specialisation for Sustainable Development Goals (S3 for SDGs) methodology.**

The EU taxonomy is a classification system establishing a list of environmentally sustainable economic activities. (Figs. 10a and 10b) It could play an important role helping the EU scale up sustainable investment and implement the European green deal. The EU taxonomy would provide companies, investors and policymakers with appropriate definitions for which economic activities can be considered environmentally sustainable²⁹.

²⁹ Source: https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en.

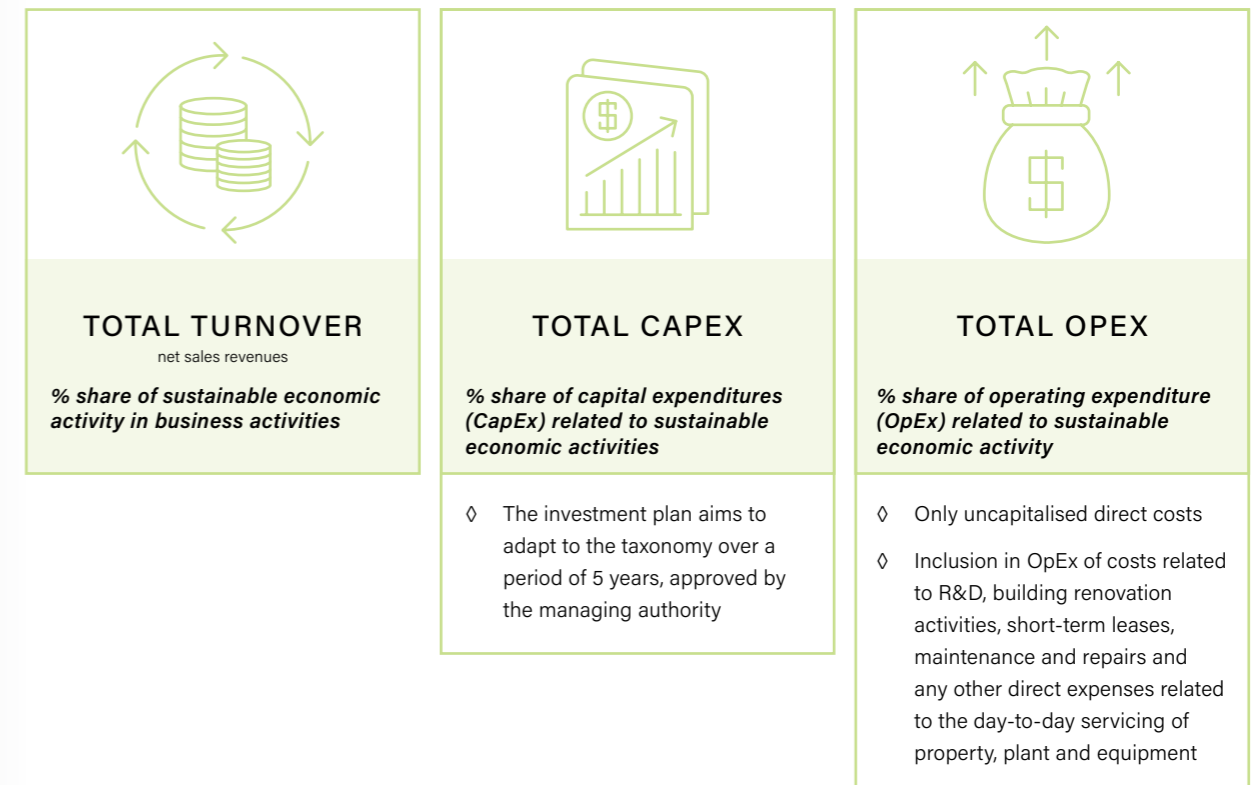


Fig. 10a. Financial indicators analysed in EU taxonomy.

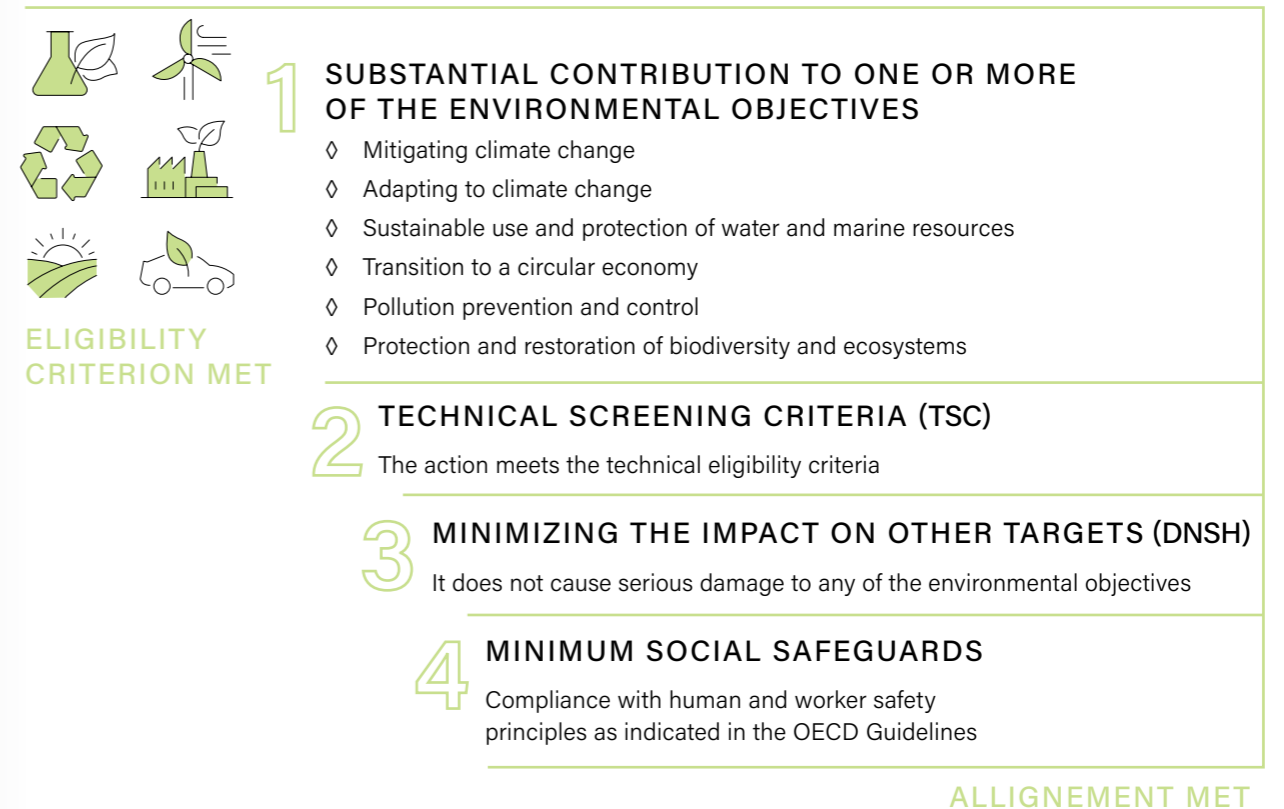


Fig. 10b. Process of passing the eligibility and compliance criteria according to EU taxonomy.

S3 for the SDGs is a methodology that drives the achievement of the SDGs through the establishment and implementation of transformative localised, place-based innovation driven strategies / roadmaps (RIS3) in a number of countries and subnational territories³⁰.

Another area of indicators relevant at the project level is related to building educational and knowledge capacities in the society. Two of the most common figures analysed are:

- ◇ **Number and share of university graduates** (in bio-economy or agrifood) who received PhD degrees,
- ◇ **Number of Innovators / beneficiaries** of the analysed project.

There is also another dimension that focuses on the outcomes which are the most impactful drivers of innovations and sustainability – the behavioural change of the beneficiaries. However, those indicators are at the qualitative level and are strictly connected to the organisational culture and the mindset of the executives among the beneficiaries of the RIS3 programmes. To measure those indicators, relevant institutions would have to start using auditing, qualitative research, and some of the diagnostic tools at the large scale.

Qualitative indicators of micro-level capacity building include:

- ◇ Measurement of **entrepreneurs' and company owners' approach to their companies** and visions for their future development,
- ◇ Measuring **efficiency and sustainability boost** thanks to the project
- ◇ Measuring **innovative and sustainable models of operating** business.

³⁰ For more information about Smart Specialisation for Sustainable Development Goals (S3 for SDGs) methodology please visit: <https://s3platform.jrc.ec.europa.eu/sustainable-development-goals>.

Managing digital transformation in the agrifood sector

THE ROLE OF THE EDIH

Digitalisation of agriculture was one of the main concerns during data collection, performed as part of the study. Adoption of digital technologies could not just save costs but lay out the foundations for further innovation and adoption of circularity regarding resources, improving logistics, better calculation of resources needed, hazard control, etc.

One sector that has already achieved high standards of production, traceability, customisation and monitoring is the automotive industry. However, the agrifood industry has been less responsive to these changes. Eleven years have passed since the introduction of the Industry 4.0 concept, and investments and applications are finally heading in this direction. All four principles of Industry 4.0 (interconnection, transparency, technical assistance, and decentralised decisions) are now operational due to latest technologies: IoT, AI, Big Data and robotics. The costs of adopting some form of digitalisation decreased, and advanced technologies are already available as software as a service (SaaS) platforms, available only by subscription.

Digital transformation is already a mature policy at the core of EU Regional development investments through Objective 1, Smarter Europe, as well as through innovation, digitalisation, economic transformation and support to small and medium-sized businesses.

The agrifood sector has the potential to experience the highest digitalization rate as it involves a multitude of processes and its level of digital maturity is still low. While industry in general is struggling to integrate processes and already existing technologies, the agrifood sector could already benefit from integrated turnkey solutions and available experience. With technology, the agrifood sector could become “cool” again. It could attract talent and leverage technology for remote field maintenance and management. This means going from a highly labour-intensive sector to a technologically intensive one.

According to the Digital Europe Programme, an important instrument available in all countries and regions is the European Digital Innovation Hubs (EDIHs). In small countries, EDIHs are the only existing consortia that cover the entire country.

It is recommended that policy makers work with these entities due to their essential role in the ecosystem. Furthermore, agrifood companies should contact EDIHs and participate in their digital transformation processes. The complete database of EDIHs and Digital Innovation Hubs (DIHs) (private organisations offering similar commercial services) is available on the JRC S3 platform³¹.

These hubs are the main one-stop-shop instrument for promoting digital transformation. They have been incubated, selected, and contracted for the next three years, starting on November 2022.

All EDIHs are formed as a consortium of tech companies, clusters, universities and business support organisations with the aim to support SMEs/mid-caps to increase their level of digital maturity and to some extent the digital transformation of the local public authorities. There are four key services and categories that all the EDIHs need to deliver (Fig. 11 and 12) and five essential technical specialisation areas from which to draw technical expertise in at least one area. It is up to each consortium to create its own mix and strategy according to the regional needs. There is also a policy coherence between the regional strategy of EDIH and the RIS3, so agrifood companies can benefit from tailored services.

³¹ Source: <https://s3platform.jrc.ec.europa.eu/web/guest/digital-innovation-hubs-tool>.



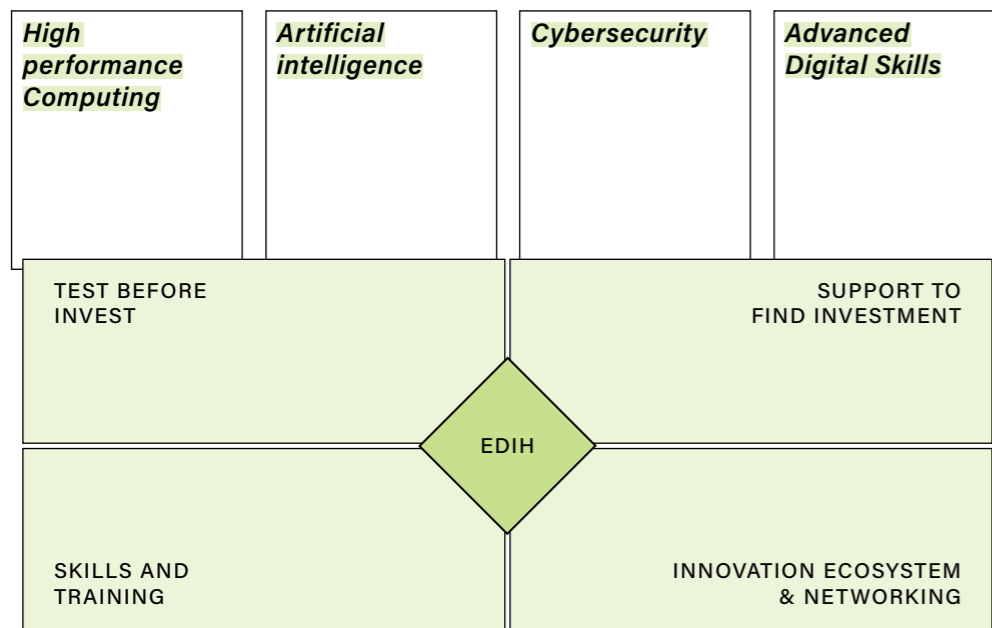


Fig. 11. Main functions of EDIHs according with Digital Europe draft regulation.

To trigger investment in digitalisation, agrifood entrepreneurs could access a digital maturity assessment³² benchmark tool, test services based on digital technologies, improve own skills, or the skills of their employees, or find a service provider and support to identify and apply for investment. All EDIHs execute their own business model, so some advanced support services could need co-investment, or could be classified as state aid.

32 More about DMA at: <https://digital-strategy.ec.europa.eu/en/events/webinar-digital-maturity-assessment-tool>.

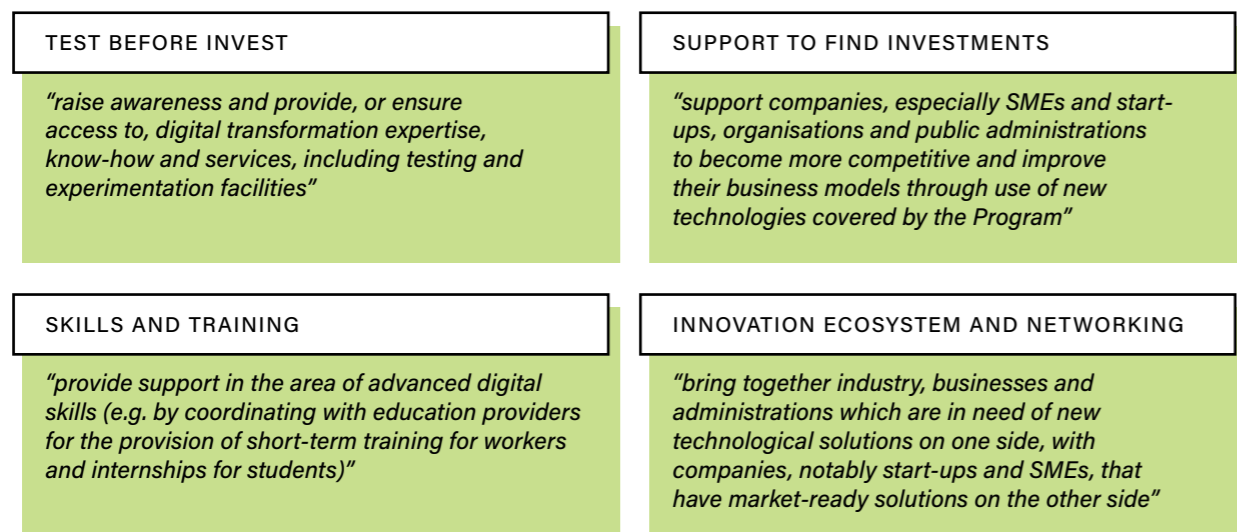


Fig. 12. Definitions of standard EDIHs, services according to the draft of Digital Europe regulation.

Bioeconomy as a catalyst for the Green Deal

The EU Green Deal and Bioeconomy are the most important and integrative concepts for the agrifood ecosystem at this moment, so understanding how they operate is essential for navigating among the actual policy framework. There is a need to make the shift from the scientific perception on green and bioeconomy to the policy and political nuances. While the EU Green Deal is a political commitment and transformative ambition, the Bioeconomy is one of the instruments that makes it possible. The progress of the EU Green Deal³³ will be assessed by monitoring the Bioeconomy. (Fig. 13).

“The Green Deal is the most transformative political initiative in Europe in recent decades, having the ambition to make Europe the first climate neutral continent by 2050”...“Bioeconomy is a catalyst for systemic change and it tackles the economic social and environmental aspects of sustainability. It seeks new ways of producing and consuming biological resources and doing so while respecting our planetary boundaries.... With the bioeconomy we will move away from the linear economy based on the extensive use of fossils and mineral resources and we go towards a more sustainable and circular economy, based on renewable biological resources³⁴”.

There are 14 other EU initiatives supporting the Green Deal in relation to bioeconomy³⁵:

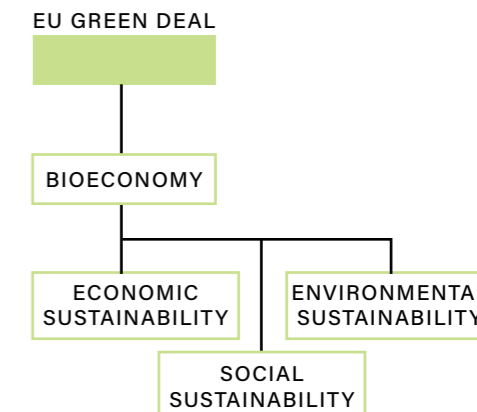


Fig. 13 Bioeconomy in the context of the EU Green Deal.

Circular economy	Biodiversity strategy
Industry strategy	Farm-to-fork strategy
Renovation wave	Chemicals strategy for sustainability
European climate law	Adaption strategy
Sustainable financing	LULUCF
Zero pollution action plan	Renewable energy
Forest strategy	Sustainable carbon cycles

Fig. 14. EU initiatives supporting the Green Deal in relation to bioeconomy.

33 See: JRC, EU Bioeconomy Monitoring System indicator update, Publications Office of the European Union, 2022.

34 Joana Drake, Deputy Director General for Research and Innovation from European Commission, on the public event “Bioeconomy: a driver for the European Green Deal?”, July 2022, more at: <https://www.epc.eu/en/events/Bioeconomy-a-driver-for-498c20>.

35 Staff Working Document accompanies the Commission Report to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the regions, European Bioeconomy Policy: Stocktaking and future developments, 2022, pp. 20-21.

In terms of complexity, the policy framework goes beyond the *EU 2018 Bioeconomy Strategy Action Plan*: up to the national and regional level. A report on Bioeconomy strategy development in EU Regions, compiled by the European Commission's Knowledge Centre for Bioeconomy, lists 359 bioeconomy-related strategies at the regional level in the EU-28. In 210 cases

(209 regional and 1 macro-regional), bioeconomy is embedded into wider strategic frameworks as displayed below³⁶. This shows that in practical terms, at regional or national level, the policy framework is adapting the major policy trends based on territorial particularities, the existing actors and governance structure. (Fig. 15)

36 European Commission's Knowledge Centre for Bioeconomy, Bioeconomy strategy development in EU Regions, 2021, p. 18.

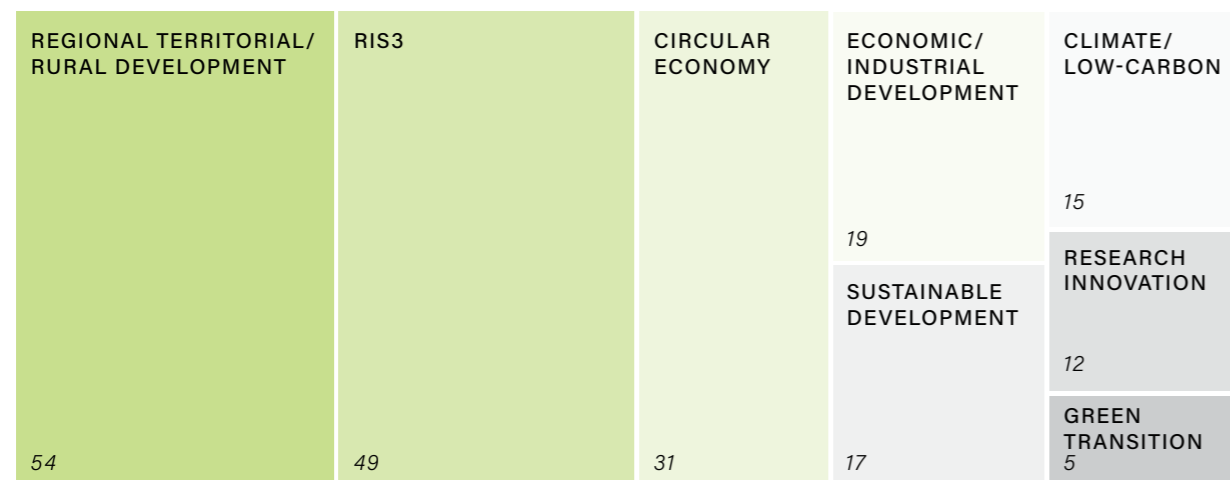


Fig. 15. Integration of the Bioeconomy concept into the national/regional policy framework.

The policy framework has tremendous implications for the EU budget and is related to innovation and digital transformation. According to the Reflection paper Towards a Sustainable Europe by 2030³⁷, the next multiannual European budget is a tool to integrate sustainability on several major policies:

The common agricultural policy will mobilise a total budget of EUR 365 billion to ensure access to safe, high quality, affordable, nutritious and diverse food for the EU's 500 million consumers. Farmers receiving area and animal-based payments will have to comply with a range of requirements related to climate change, water, soil, biodiversity and landscape. They will also face public health, plant and animal health and welfare obligations.

'Horizon Europe' is the largest ever EU research and innovation program. It will mobilise EUR 100 billion allocated to the climate, including clean energy transition objectives.

Digital Europe Programme with a budget of EUR 9.2 billion will be an enabler to support the provision of large-scale capacities in high-performance computing and artificial intelligence. This will offer new opportunities for sustainable development, including for reducing CO₂.

Beyond the general policy and funding mechanisms, it is important to see if there is a shift in the market for the bioeconomy. According

to Eurostat monitoring the UN Sustainable Development Goals (SDGs) of the UN, the share of organic agriculture in the total agricultural area nearly doubled from 2005 to 2017 in the EU28.

More recent data show an improvement at the EU27 level. The following 17 countries that were covered by the analysis have been taken into account while results are presented on the following graph (Fig. 16). The graph shows how countries are transitioning towards this trend, the scale of the activity, and how much potential is to grow. Smaller countries like Estonia and Latvia managed to increase their share in organic farming and they are also very dependent on external markets. At the other end of the spectrum, Poland, Romania and Turkey have large production capacities, larger enough to assure internal consumption and to export food. Serbia is also focused on agriculture but at the moment it does not have an easy access to the European market.

37 EC, ANNEXES to the Reflection Paper 'Towards a sustainable Europe by 2030', 2019, pp. 10 -11.

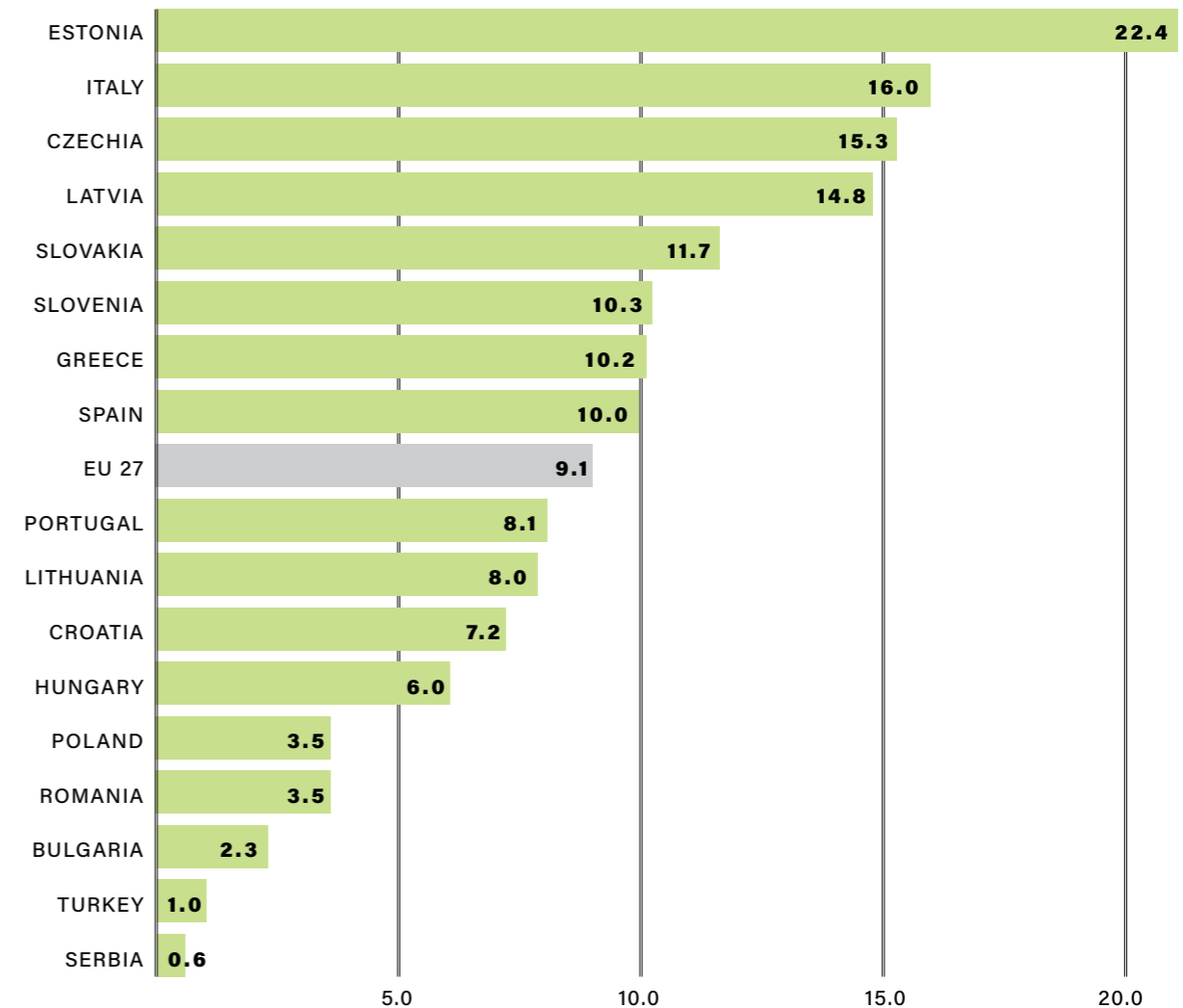


Fig. 16. Area under organic farming, % of total utilised agricultural area (Eurostat, 2020).

Like digitalisation, bioeconomy is a transformation based on hands-on practices of companies in several areas. Although innovation intensive and highly dependent on RDI support to develop the best practices, agrifood companies need to take this into account. Incentivising only the bioeconomy is not enough and is not sustainable in the long term. The critical mass created by the common agricultural policy must be sustained by the consumers: their sustainable behaviour and values.

Another perspective on bioeconomy is the cascading impact of the regional policies on sustainability of the innovation ecosystem in the region. To help policy makers match RIS3 with UN SDGs, the JRC together with the UN Inter-Agency Task Team on Science, Technology, and Innovation for SDGs Roadmaps co-invented

Smart Specialisation for Sustainable Development Goals (S3 for SDGs). The S3 for SDGs is a methodological approach that aspires to integrate Sustainable Development Goals (SDGs) and resulting sustainability challenges in the whole policy cycle of Smart Specialisation Strategies: from their design to implementation, monitoring, and evaluation³⁸.

Policy making practitioners willing to get familiar with the details of S3 for SDGs are referred to s3platform.jrc.ec.europa.eu/w/smart-specialisation-sustainable-development-goals-and-environmental-commons³⁹. They should also analyse the reflection framework for existing and new RIS3 and innovation policies (See Fig. 16a).

38 D. Pontikakis, I. González Vázquez, G. Bianchi, M. Ranga, A. Marques Santos, R. Reimeris, S. Mifsud, K. Morgan, C. Madrid, J. Stierna, Partnerships for Regional Innovation – Playbook, Publications Office of the European Union, Luxembourg, 2022.

39 N. Nakicenovic, C. Zimm, M. Matusiak, K. Ciampi Stancova, Smart Specialisation, Sustainable Development Goals and environmental commons. Conceptual framework in the context of EU policy, Publications Office of the European Union, Luxembourg, 2021.

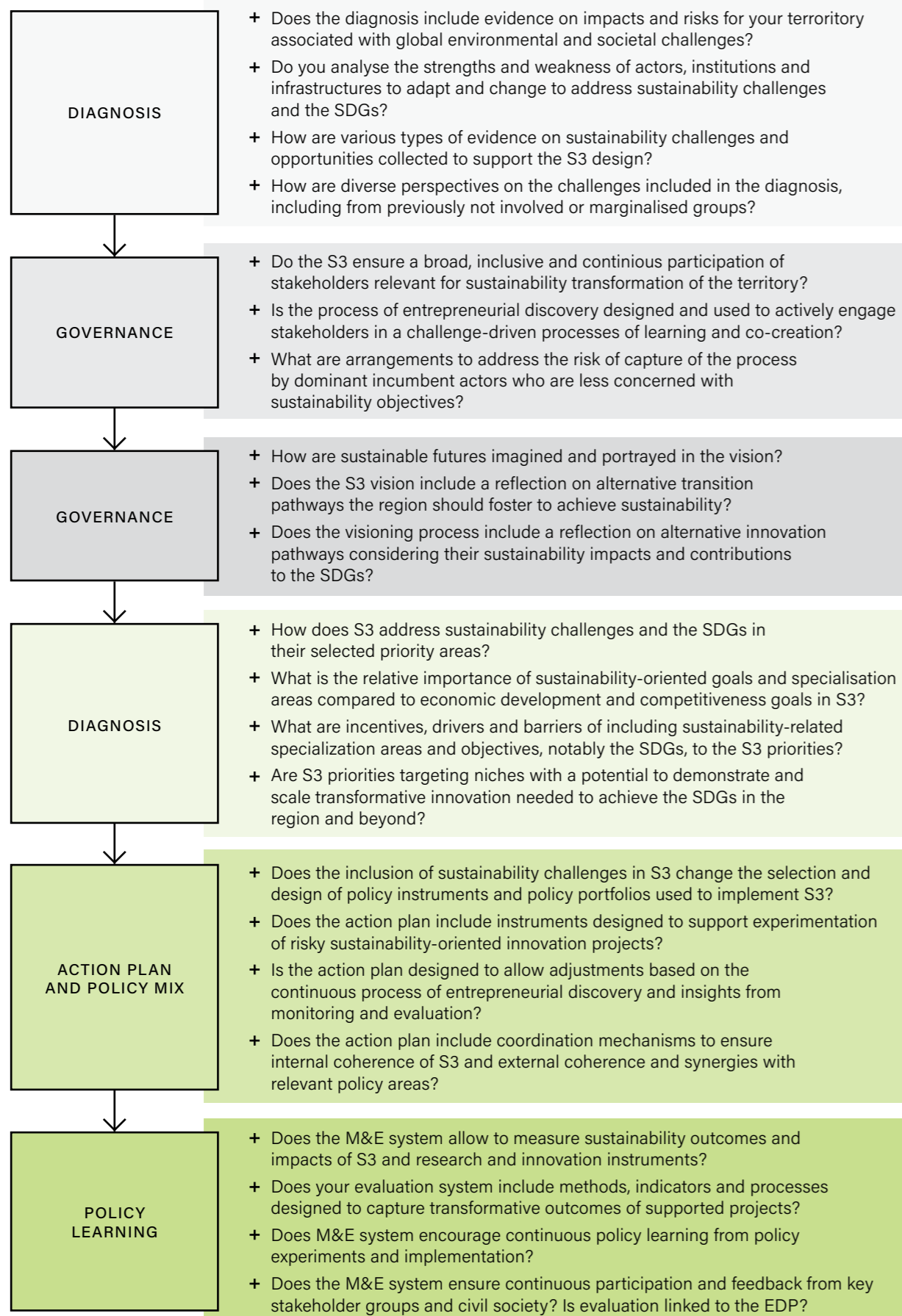


Fig. 16a. The reflection framework for existing and new S3 and innovation policies (JRC PRI), 2022.

Furthermore, local level policy makers willing to support the bioeconomy, entrepreneurs and doers should look into the following chart. It shows how sustainability practises can be integrated in agrifood companies along the theoretical processes. It does not show the ecosystem and support services for bioeconomy, but how internal processes can support sustainability overall.

Essentially, for agrifood companies, the model must generate a "green margin" and support a business model that focusses on sustainability and innovation in all processes. (Fig. 17)

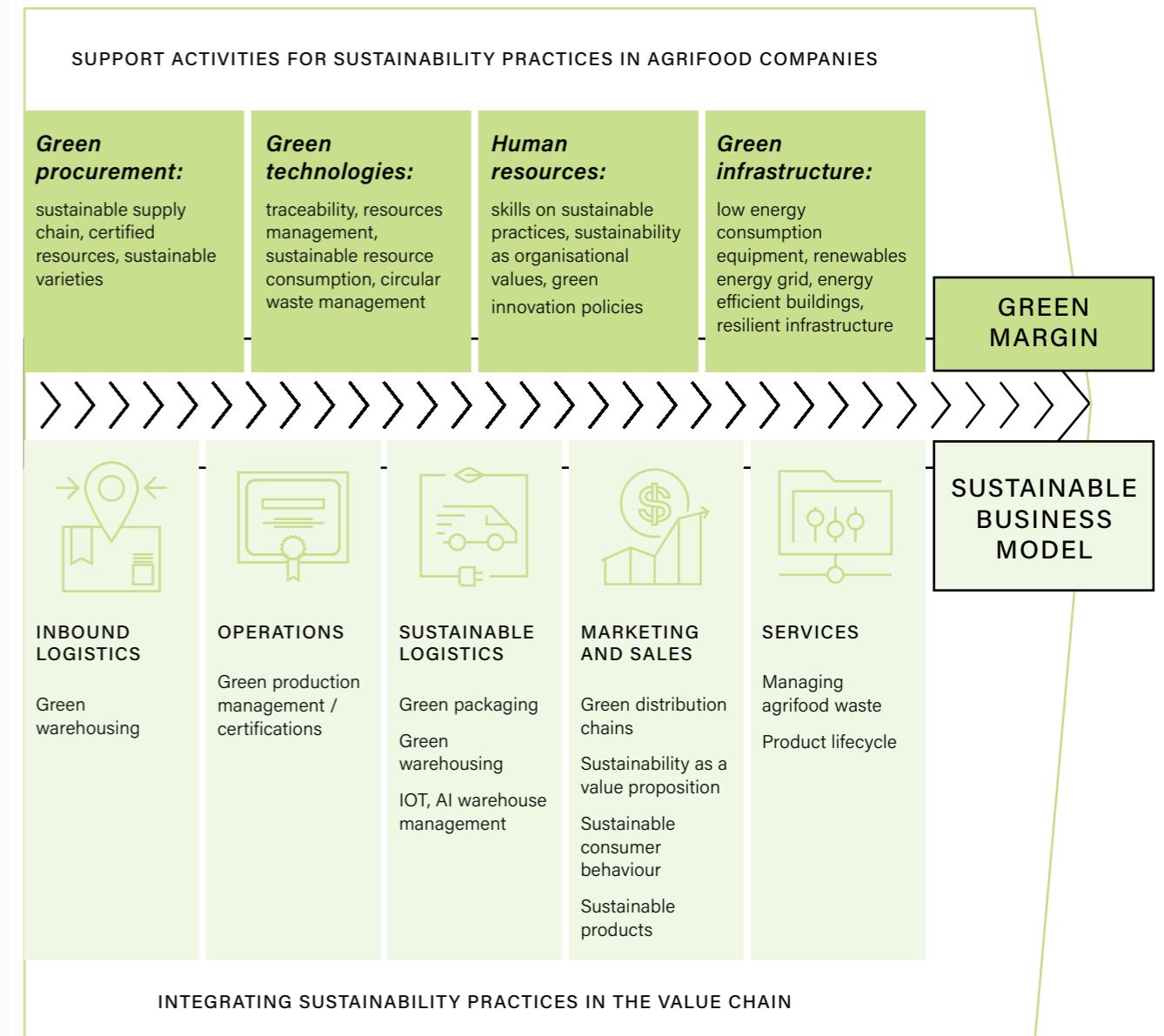


Fig. 17. Integrating sustainability practices in the value chain of agrifood companies.

The value chain map has been filled with inspiring examples from the projects related to bioeconomy that have been identified during the 17 countries study. The visual conclusions are in Figure 18 below.

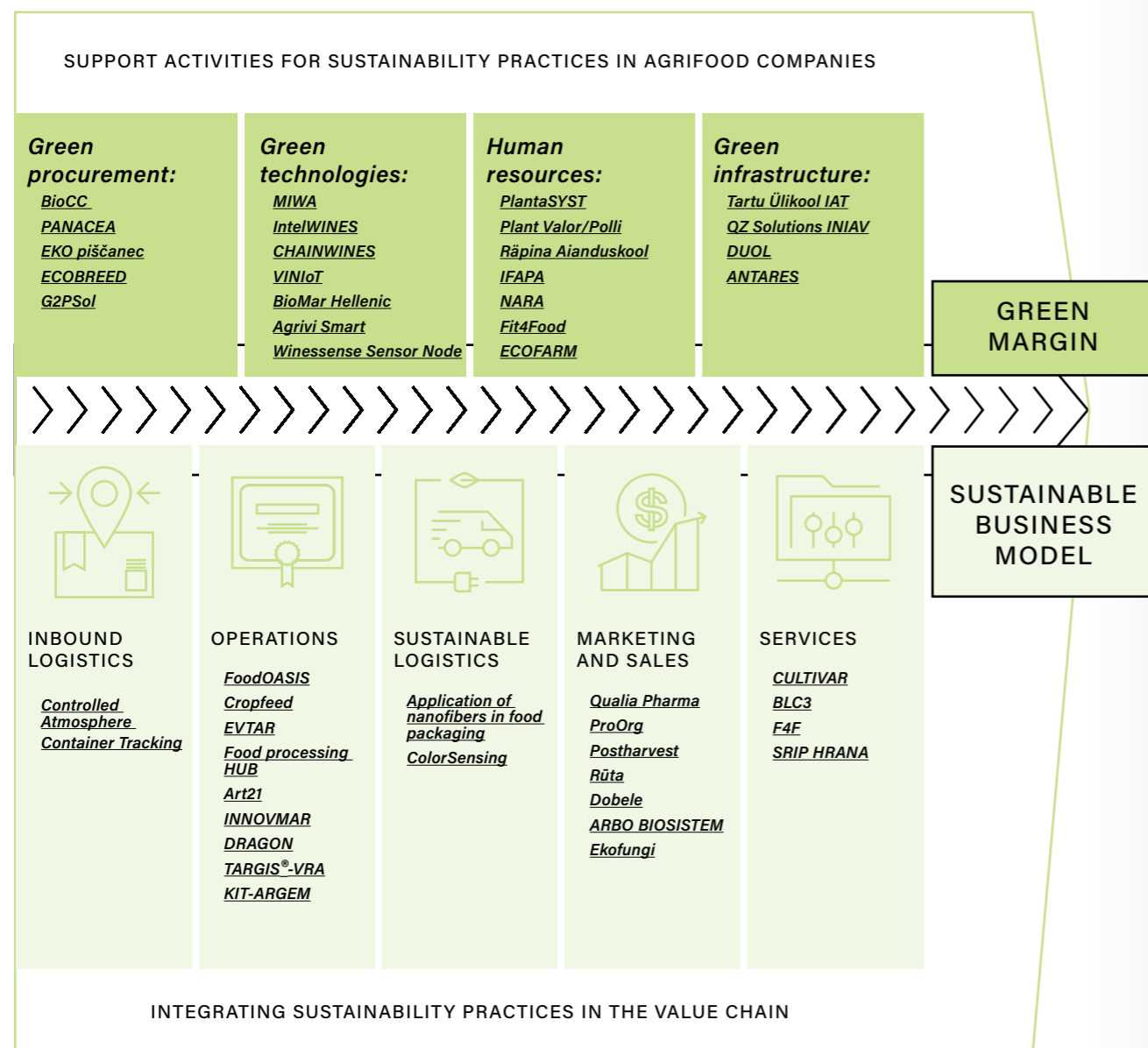


Fig. 18. Examples of implemented projects that integrate sustainability practises in the value chain of agrifood companies.

Summary

The RIS3 Guidebook presented the most relevant contexts, insights, approaches and frameworks that could be useful for effective implementation of RIS3. The authors wanted to highlight how the outcomes of two research studies of policies and practices can provide guidelines and inspiration for RIS3 practitioners, policy makers and agrifood actors willing to implement policy trends in their current initiatives.

Main takeaways of this guide are backed by practitioners and doers experience in the vast area of European policy making. Consider the following ideas stressed in this document, as they are drivers for relevant and successful usage of RIS3 as methodology:

1. Find **triggers to break the 'business as usual'** way of thinking among potential beneficiaries of RIS3 in agrifood-related activities.
2. **Include relevant stakeholders** in the process of discovering specialisation niches (EDP), promoting favourable priorities, and designing actionable plans supporting agrifood transformation. The ecosystem itself is also an important actor in the process of ongoing validation of the goal and the methods chosen to achieve them.
3. **Govern RIS3-related processes.** Apply models of choosing leadership for the process, as well as methods of effective communication and engaging stakeholders. RIS3 as a practical tool, but it has relatively low awareness and interest among actors in the agrifood industry. Therefore, effective communication, especially addressing the benefits of participation, is one of the keys to effective governance and implementation and will help prepare for the future policy shifts.
4. **Prioritize climate and environmental goals** in agrifood innovation. "Business as usual" is no longer an option, especially for traditional agricultural operators, since all future payments will have to comply with a range of requirements related to climate and environmental change. These include water, soil, biodiversity, and landscapes, as well as public health and plant and animal health and welfare. Adopting digitalisation and enhancing technological advancement is now an available means of addressing the climate and biodiversity threat for existence and not just a goal for RIS3.
5. **Fix a gap with respect to access to finance for SMEs** for which R&D measures are the most favourable. The gap cannot be solved with only minor innovation vouchers. Complex funding requires increased knowledge on the part of agrifood applicants, so local "knowledge hubs" (universities, RDI centres, EDIH, etc.) should be considered.
6. **Employ cross- and inter- sectoral cooperation as key** to overcoming the challenges of the competitive and fragmented global agrifood market. The role of farmer cooperatives, sectoral clusters, and chambers of commerce is even more significant than before in the context of environmental shifts expected in the agrifood (i.e. traceability, circular economy, measuring soil sequestration). Their participation in international networks is essential to bring knowledge and opportunities to their members. Since individual agrifood producers usually innovate within the knowledge and capacity limits of their network, it is best if the network is internationally connected.
7. **Build the image of the agrifood system as innovative** to reverse leaching of talents. Nowadays, talents from the life sciences and agrifood sector move to other, more prestigious sectors like ICT, finance, or engineering. Young people can be attracted back to the agrifood sector with a promising and fulfilling career path. Making agrifood a "cool" sector again for the younger generation can be achieved through technology.

Appendix 1

FUTURE OF THE AGRIFOOD SECTOR AFTER COVID-19: A FORESIGHT PERSPECTIVE

At the end of 2022, COVID19 might seem a shadow of the past, but its effects could prevail. It generated new patterns of consumer behaviour and to some extent affected how digital technologies are adopted.

In terms of policy making, the resiliency concept just became tremendously important for the stability of our economic structure. At the end of 2020, EIT Food CLC NE Partners, RIS Policy Council members and EIT Food Hub organisations in 12 CEE countries (Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Serbia, Slovakia, and Slovenia) joined forces to deliver the FOOD Foresight report. The report viewed the existing crisis situation as a source of opportunities for the agrifood players. Some of the findings are presented here in relation with the innovation policy context created by the RIS3.

The vulnerabilities are significant issues in a majority of the countries and probably still present at the regional level. They concern ageing population, labour & skill shortage, pressure on cost competitiveness and high dependence on external markets⁴⁰. These are not new and were not generated by the Covid19 context which only added an additional layer of high-level uncertainty. The current geopolitical situation and war in Ukraine are also to be taken into account.

40 EIT Food CLC North East, Food Foresight: Impact of COVID-19, on the agri-food sector in Central and Eastern Europe, 2022, p. 41.

Without resilience, the agrifood industry is one of the first to feel the shocks of crisis situation. Recent evolution has shown that resilience is not only a theoretical concept for policy makers, but an essential matter for companies as the economy is resilient as much as the companies. We could expect that this concept will enter general company processes such as innovation and digitalisation.

Regarding positive scenarios, desired change, and opportunities for a sustainable recovery, we are analysing the potential to generate innovation for each category of the supply chain. It is a simplified structure compared to the theory of change, where we have the challenge of reaching sustainable recovery based on the opportunities generated by different sources. Adopting innovation could become a driving force. The whole model is based on some assumptions, but the idea is for innovation to be an essential factor throughout the process.

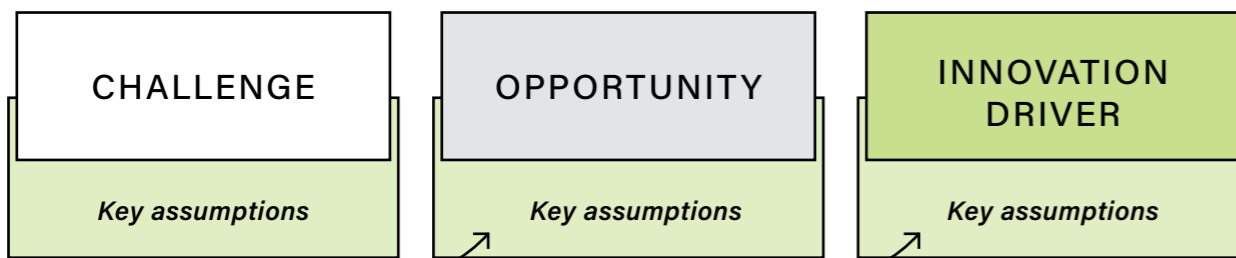


Fig. 19. Proposed model for analysing foresight positive scenarios.

FARMERS AND INPUT PROVIDERS

Opportunities

Potential new consumer base due to an increase in the number of individuals looking for local products.

More direct contact with consumers and higher margins by shortening the distance between farmers and consumers as a result of changing consumer preferences.

Innovation driver

The innovation driver could be to reposition the general business: from selling to intermediaries only to a more direct contact with consumers using digital tools. Digital technologies could shorten the producer – consumer interaction without taking out the specialized stores whose logistical scope will remain. If consumer data are shared among retailers and producers, new business models could be established.

Registering data could help the producer to understand consumer behaviour, foresighting and adapting to changes.

Key assumptions: Producers and specialised shops are adopting digital technologies. While the producer is willing to expand the digitalisation tools outside of the current production towards sales, the shop is willing to adopt digital technologies and expand them towards the final client (ex. user experience). In fact, all three parties are sharing data. This supports the farm-to-fork model.

Opportunities

Innovations in the production process to improve resource efficiency and lower environmental impact. Possible due to social awareness and preferences requiring alterations to the production process.

Opportunity to “green” the food production process.

Innovation driver

Innovation could possibly support sustainable practices, circularity or regenerative agriculture - all require RDI intensive support.

Clients trust sustainable and transparent solutions. Sustainable products could attest their value thanks to traceability technologies.

Key assumptions: Local RDI system is transferring knowledge to local producers and part of the business model is betting on sustainability. Private investors and VCs are supporting the transitioning companies as circular companies could become more resilient.

FOOD PROCESSING, STORAGE AND TRANSPORT

Opportunities

Need for greater self-sufficiency within the country or region due to trade and supply chain disruptions.

Innovation driver

Local authorities are investing in new logistics and long-term storage solutions to secure freshness of local agricultural products. Innovation in logistics, shelf-life sensors, biosensors indicating freshness and stock management application are used to support local food hubs (buffers). These structures protect local production from price fluctuations, improve urban resiliency, HORECA and quality of life.

Key assumptions: RIS3 policies are supporting the investments in infrastructure and technologies. Local authorities develop business plans based on local production characteristics.

RETAILERS, RESTAURANTS AND CONSUMERS

Opportunities

Growing interest in specialized stores positively impacts on margins thanks to continued socio-economic development or health & dietary needs.

Innovation driver

Producers are increasing the production of alternative foods and new receipts that support new dietary needs. This transformation is supported by local laboratories in terms of the component of nutrition and micronutrients. With new recipes, local specialized stores and restaurants are being able to meet dietary and calorific requirements.

Concept food stores are becoming an "oasis" for individuals with health issues, allergies or increased expectation from food.

Key assumptions: RIS3 policies are supporting investments in professional HORECA schools as a strategic area that increases the quality of life and wellbeing.



Appendix 2

MEMBERS OF EIT FOOD RIS POLICY COUNCIL 2021/2022

Name	Country	Organization and role
Mariya Hristova	Bulgaria	Senior expert in the Programming and Planning unit of the Rural Development Directorate at the Ministry of Agriculture, Food and Forestry of Bulgaria
Matija Zulj	Croatia	CEO and Founder at AGRIVI
Jitka Gotzova	Czechia	Director of Food Safety Department at the Ministry of Agriculture of the Czech Republic Chair of Supervisory Board of Food Research Institute Prague
Andre Veskoja	Estonia	Director of Estonian Crop Research Institute (ECRI)
Ioannis Spandos	Greece	Public Officer in Department of European Union Projects at the Regional Development Fund for Central Macedonia
Diana Banati	Hungary	Professor, Vice-Dean for Science, Faculty of Engineering at the University of Szeged
Daniela Sani	Italy	Program Manager at ART-ER (Emilia-Romagna Joint Stock Consortium)
Enno Ence	Latvia	Co-owner, Chairman of the Board at MILZU! company, member of the Latvian Chamber of Commerce and Industry
Giedrius Bagušinskas	Lithuania	Founder, board member, executive director at Lithuanian food exporters association (LitMEA)
Elwira Rycaj	Poland	Director of Scientific Research Center at Maria Curie-Skłodowska University in Lublin
João Leitão	Portugal	Associate Professor with Habitation University of Beira Interior in Covilhã
Claudiu Mitrea	Romania	Sectoral Specialization Office Expert at North-East Regional Development Agency in Piatra-Neamț
Dubravka Škunca	Serbia	Professor at the Faculty of Business and Law of MB University, LCA Leader, Green Protein Project for European Commission
Miroslav Zahradnik	Slovakia	Researcher at the National Agricultural and Food Centre (NPPC), Research Institute for Animal Production in Nitra
Iljan Gasan Osojnik Crnivec	Slovenia	Research Fellow in Department of Food Science and Technology at University of Ljubljana Visiting Researcher at University of Cambridge
Maria Dolores de Toro	Spain	General Manager of the Agrifood Campus of International Excellence ceiA3
Begüm Önal	Turkey	Food Safety and Operations Manager at Gourmet International Ltd., a food trading company based in Izmir

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- Arvalis: www.arvalis.fr.
- CAPBIO4BG Project: capbio4.bg/html/en/.
- Institute of Entrepreneurship Development: ied.eu/project-updates/what-is-an-innovation-broker-and-what-does-it-do/.
- Territorial Economic Data Viewer (TEDv): s3platform.jrc.ec.europa.eu/synergies-tool.
- About S3 for SDGs: www.interreg-central.eu/Content.Node/SMARTwatch/Smart-Specialisation-for-Sustainable-Development-Goals.html.
- About EDIH network and country contacts on the JRC platform: s3platform.jrc.ec.europa.eu/web/guest/digital-innovation-hubs-tool.
- Digital Maturity Assessment presentation: digital-strategy.ec.europa.eu/en/events/webinar-digital-maturity-assessment-tool.
- About RIS3, Governance on the JRC platform: s3platform.jrc.ec.europa.eu/governance.

