



RI4C2  
Research & Innovation  
For Cities & Citizens



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101035803

# Vivid EC2U local Knowledge Ecosystems

**DELIVERABLE 6.2**  
MONTH 18

## D6.2 – VIVID EC2U local Knowledge ecosystems

### Table of contents

Table of contents.....	2
1. Executive Summary.....	3
2. Introduction.....	4
3. Problem Statement .....	5
4. Scope And Objectives.....	7
5. Conceptual Framework.....	9
6. Methodology To Identify Local Stakeholders.....	16
7. Characteristics Of The Local/Regional Knowledge Ecosystems .....	17
8. A Sociometric Analysis Of The Local/Regional Knowledge Ecosystem .....	38
<b>9. Policy Recommendations .....</b>	<b>45</b>
Policy Topic 1: Relationships With Local Stakeholders.....	45
Policy Topic 2: Cooperation Instruments.....	47
Policy Topic 3: Good Practices And Lessons Learned.....	48
Policy Topic 4: Measurement Instruments Of Civic Engagement In R&I Activities.....	49
10. References.....	51
11. Annexes.....	55
Annex 1. Knowledge Ecosystem Glossary .....	55
Annex 2. Relationships Framework Among Stakeholders In The 7 Local/Regional Knowledge Ecosystems.....	57
Annex 3. Cooperation Instruments In The Seven Local/Regional Knowledge Ecosystem.....	61
Annex 4. Good Practices And Lessons Learned In The Seven Local/Regional Knowledge Ecosystem .....	64
Annex 5. Measurement Instruments Of Civic Engagement In R&I Activities In The Seven Local/Regional Knowledge Ecosystem .....	68

## 1. Executive summary

The Alliance of European Universities “European Campus of City-Universities—EC2U”, consists of seven long-standing universities across Europe: University of Poitiers (France), University of Salamanca (Spain), University of Coimbra (Portugal), University of Pavia (Italy), Friedrich-Schiller University of Jena (Germany), “Alexandru Ioan Cuza” University of Iasi (Romania) and University of Turku (Finland). The Alliance aims to widen its initiative in the field of Knowledge square (Education, Research, Innovation, Service to society), and to shape a common framework dedicated to a Pan-European Knowledge Ecosystem (PEKE), composed of a network of local KE of the RI4C2 Alliance’s partners.

A Knowledge ecosystem is meant to boost exchanges of knowledge, to join forces, to build strong bridges across institutional and disciplinary boundaries, to look for new collaborative formats and spaces in order to address shared challenges, and shape their own changing roles in the process. The performance of the local/regional Knowledge ecosystem consists in a better vision regarding the linking between universities, seen as promoters of value creation and innovation, with their local/regional stakeholders. A sustainable long-term Knowledge ecosystem is kept alive through continuous dialogue and cooperation between policy and research area, and among all categories of stakeholders.

In order to identify and shape the characteristics of the seven local/regional Knowledge ecosystems, we developed an online questionnaire-based survey that was applied in the seven university communities of the RI4C2 Alliance, targeting different categories of stakeholders: universities and research entities, innovative start-ups, local authorities, venture capital, sponsors, service organizations, incumbent firms, and citizen science entities. Moreover, to increase our understanding of the seven local/regional Knowledge ecosystems, we have organized focus-group/workshops/debates/discussions/interviews/meetings with the representatives of local and regional stakeholders that addressed stringent issues and the needs of contemporary societies.

The survey results and the discussions triggered within focus groups pointed out that most of the stakeholders are active at the local/regional level, some of them at the national level, and a small amount of them at the international level. All the respondents mentioned that their organizations/entities develop research and innovation activities that are performed with other players, mainly with public actors. Overall, most of the respondents consider their relations with other stakeholders in terms of: “excellent”, “very good”, “good”, “fine”, and “quite poor”.

This document provides thorough findings of the local/regional KE of the seven partners, their particular characteristics, various relationships among different categories of stakeholders, cooperation instruments and best practices used in the system for creating value in the local communities.

As engines of research and innovation, universities must aggregate with other categories of stakeholders in order to design a common vision and agenda for modern society. Engagement with external stakeholders should become a strategic concern, as one of the highest priorities for universities. Thus creating new levers for the development of strong partnerships.

The lessons learned reinforce the true necessity to bring Science outside the University and make the scientific language more understandable. At the same time, it is necessary that Citizens challenge researchers, entrepreneurs, business owners and policymakers to reinvent the way they communicate their ideas and projects. Accordingly, citizen science will develop as a mechanism for involving society and stimulating the population's interest in scientific outcomes, and most importantly contributing to their scientific literacy.

## 2. Introduction

The European Research Area (ERA) has on its agenda important topics to debate: a single market for research and innovation fostering free movement of researchers, scientific knowledge and innovation, as well as a more competitive European industry. ERA has four strategic objectives, in order to broaden the new priorities and to deepen the existing ones: 1. prioritising investments and reforms; 2. improving access to excellence; 3. translating R&I results into the economy, and 4. deepening the policies that promote the free circulation of knowledge (European Commission, 2020, p. 2). Today, R&I systems are facing extensive, all-embracing changes and transitions due to the rise of new challenges (climate change, pandemics, demography, etc.) (European Commission, 2022b, p. 8). All the actors involved in the R&I system play crucial roles to respond to all societal changes.

Large-scale scientific and societal problems tend to be extremely complex, have multiple causes, and will never find a single and perfect solution. As the required expertise to address such complex problems is both specialized and scattered, the search for solutions and related knowledge creation increasingly occurs in ecosystems of individual and institutional actors, involving diverse inputs, resource commitments, and motives. This potential has led national policymakers in many countries to actively promote knowledge and innovation ecosystems as engines for growth and well-being (Järvi, 2018).

According to the ERA Policy Agenda, “the R&I landscape has profoundly changed since the 2008 Commission Recommendation on the management of intellectual property in knowledge transfer activities. An update is needed that moves from the traditional concept of knowledge transfer to the valorization of knowledge assets, generated by different types of actors in a dynamic R&I ecosystem. New challenges must be addressed like the increasingly complex knowledge value-chains, new market opportunities created by emerging technologies, new forms of industry-academia collaborations and involvement of citizens, as well as reciprocity in the management of intellectual property in international R&I cooperation” (European Commission, 2021b, p. 10). The aim of the new ERA Agenda is to achieve an alignment of measures and policy instruments for improving knowledge sharing and valorization in Europe. In this respect, building up regional and national R&I ecosystems to improve regional/national excellence and competitiveness is seen as a key priority area.

A Knowledge ecosystem refers to how knowledge is created, developed, transferred, and integrated among involved systems and subsystems. This complex ecosystem is usually formed around technological or societal challenges and encourages value co-creation among actors, as a transformative process. This process usually implies collaborative research work, with universities and public research institutions as central actors. The proximity of involved entities is a central characteristic of the system, however, it may not always be considered a determining factor.

### 3. Problem statement

As described above, a Knowledge ecosystem refers to a system of interconnected components that work together to create, share, and use knowledge. It includes the processes, tools, and platforms that support the creation, dissemination, and application of knowledge, as well as the cultural and social context in which this occurs. A Knowledge ecosystem's main goal is to generate new knowledge and valuable open-ended solutions for the participating actors that drive innovation, improve decision-making and support learning and growth.

At the centre of the Knowledge ecosystem system is the university surrounded by different actors at local and regional levels. This interconnected diversity of stakeholders brings the capacity to find solutions to address society's challenges. In this sense, regions become hubs for systemic innovation. Universities, as creating and transferring knowledge, are fundamental for R&I. The academic institutions open a “global pipeline” of knowledge to regional stakeholders, and such knowledge “has to be translated into the stakeholders’ own concepts and contexts so that it may be absorbed and create value. Hence, whether or not a university succeeds in becoming a global knowledge pipeline for external stakeholders depends on the quality of the translation process between academic knowledge and external knowledge sectors of the business or public spheres” (EUA, 2019, p. 32). Engagement with external stakeholders should become a strategic concern, as one of the highest priorities for universities.

Universities, as central actors, have a responsibility to “align governance of innovation and transformations at different levels: local, regional, national and European one, including the promotion of smart specialization” (FoSS, 2021, p. 2). Universities are major contributors to local innovation ecosystems and economic growth through their education, research, and innovation. The local Knowledge ecosystem's performance consists of a better vision regarding the linking between universities, seen as promoters of value creation and innovation, with their local innovation ecosystem. In order to reach this goal, universities should have better incentives to offer education with the type of skills required in the job market as well as more incentives to produce high-quality research and become more oriented towards entrepreneurship. This will require changes in incentive systems, educational orientation and university governance.

The R&I system is influenced by the rapid transformations of today's society. Thus, in R&I programs, there is a real need to adopt a more holistic approach, creating synergies between sub-systems such as climate, energy, mobility, built environment, technologies, health and well-being, social innovation and circular economy. Also, Cities will become “nodes of global networks

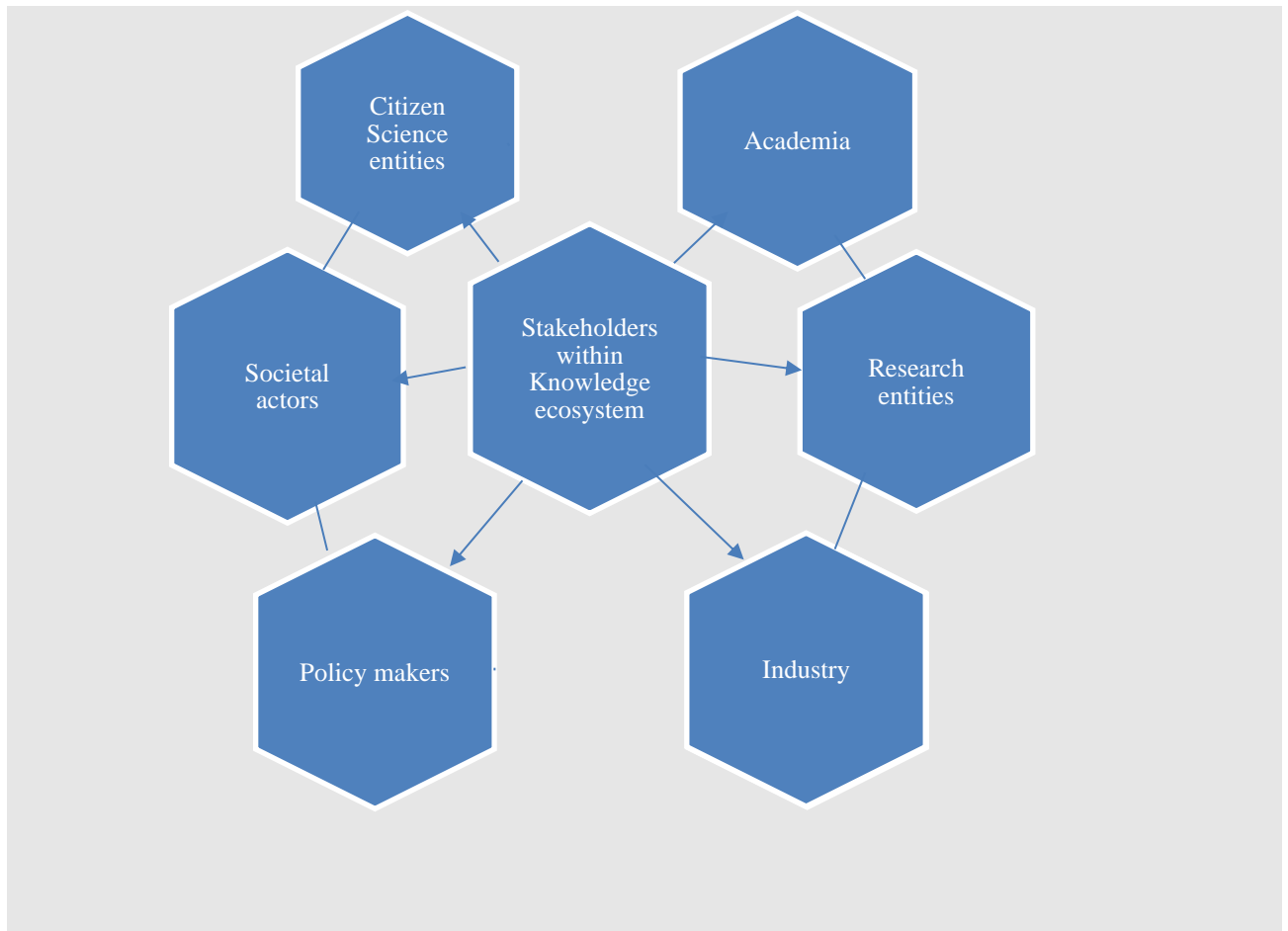
of skills, knowledge and capital and the added value of connectivity and collaborative networks across all types of cities and regions, as central to innovation. Thus, the necessity of systemic and cross-sectoral approaches, co-creation of solutions with urban stakeholders and citizens, engaging them as 'city makers' to design the cities of the future" (European Commission, 2022b, p. 92).

A new vision concerning local Knowledge ecosystems puts Citizens at the centre of the process and considers Cities as "living labs of innovation", places where strategies for dealing with the most important challenges such as climate change, decarbonization, energy, transport, industry, circular economy, biodiversity, natural resources, health and well-being, social inclusion and social innovation, coexist and intersect.

Bringing Science closer to Citizens, by involving them in scientific processes, should be a desiderate on the policy agenda of R&I: Citizens and local communities "need to be empowered and activated to act. To create stronger public understanding, connection and engagement should be promoted through regular citizen science campaigns as well as education and training activities. New R&I solutions need to be co-designed and co-implemented together with citizens to ensure that there is societal uptake of these new solutions and approaches. One of the main goals is to strengthen the trust in the various ways society is influenced by science and, on the other hand, how science is influenced by choices, dilemmas and responsibilities that arise in society" (European Commission, 2021b, p. 17).

The Knowledge ecosystem is meant to boost the exchange of knowledge, join forces to build strong bridges across institutional and disciplinary boundaries, look for new collaborative formats and spaces in order to address shared challenges, and shape their own changing roles in the process. A sustainable long-term KE is kept alive through continuous dialogue and cooperation between policy and research areas as well as all categories of stakeholders. How they are connected to each other is very important in order to identify and capture synergies, develop complementarities, and ensure the effective transfer of knowledge (FoSS, 2021).

**Figure 1** represents the local stakeholders who frame the local Knowledge ecosystem. Citizen Science represents an important actor who will play a decisive role in the near future, in the framework of the research and innovation system.



**Figure 1. Stakeholder representatives**

Bringing stakeholders closer to each other and increasing interaction and collaboration between actors within the local research and innovation ecosystems and across ecosystems can significantly contribute to the development of networks, structures and platforms. In this way, we reduce the distance between fundamental and applied research, experimental development, and innovation activities, and thereby allowing actors to combine their competencies to address local societal challenges more effectively (FoSS, 2021). All these principles enable KE to tackle difficult local societal challenges, often in collaboration with other ecosystems beyond their geographical borders.

#### 4. Scope and objectives

This policy paper addresses the need for a strengthened ERA by enhancing the Knowledge ecosystems across Europe and their interconnections. As a result of a study conducted in the RI4C2 project, this document presents the characteristics of the Vivid Local Knowledge ecosystems in order to achieve a common line on measures and cooperation instruments for improving

knowledge sharing and valorisation in Europe. The aim of this policy paper is to underline existing cooperation mechanisms, significant topics and engagement types, best practices and lessons learned, so as to build up regional and national R&I ecosystems. Furthermore, it aims to improve regional and national excellence and competitiveness.

This document provides detailed findings of the local Knowledge ecosystem of the seven RI4C2 project partners, their specific characteristics, best practices and cooperation instruments used by different stakeholders in order to create value and seize growth and innovation opportunities. The ecosystem-level output is generally research-based knowledge and associated applications, where the ecosystem actors jointly create and explore new knowledge as a shared resource.

The policy paper's general topics are:

- Policy topic 1: RELATIONSHIPS AMONG LOCAL STAKEHOLDERS
- Policy topic 2: COOPERATION INSTRUMENTS
- Policy topic 3: GOOD PRACTICES AND LESSONS LEARNED
- Policy topic 4: MEASUREMENT INSTRUMENTS OF CIVIC ENGAGEMENT

The main objectives of this document are:

- To set selection criteria for identifying the local KE stakeholders
- To provide a socio-metric analysis of existing cooperation instruments among stakeholders
- To highlight lessons learned and best practices from each partner project
- To set selection criteria for identifying the local Citizen Science Champions
- To provide a measurement instrument for civic engagement in R&I projects
- To provide a series of recommendations based on the experience of the local R&I ecosystems.

To improve excellence, to have a greater societal impact, and to increase trust in science there is a real need to involve and engage citizens, civil society and local communities in the R&I process. Citizens can make meaningful contributions to and participate in research projects in different phases, such as defining the issue, collecting data, participating in experiments, dissemination, and volunteer thinking. It is ultimately one of the solutions to start a dialogue and motivate Citizens to participate in research. Collaboration with these different groups of quadruple/quintuple-helix actors is very complex and needs specific support (European Commission, 2022b). Mapping the existing partners from diverse sectors in the local/regional KE can thereby lead to an easier, faster identification of needed actors/partners.



## 5. Conceptual framework

This section provides an overview of the Knowledge ecosystem concept, which gained traction in recent studies, with a focus on how the Knowledge ecosystem is organised and the relationship between its components. Our overview of the previously published works on the KE topic includes the following documentation sources:

- a. Peer-reviewed journal articles;
- b. European Commission documents (e.g. analytical reports, policy briefs, position papers);
- c. National government reports on the topic;
- d. Statistical data from official websites (e.g. INS, EUROSTAT).

### 5.1 Knowledge ecosystem

Ecosystem is a borrowing concept, used to describe the organization of interdependent actors (e.g., Academia, Industry, Policy Makers, Societal actors, Citizen Science Entities) that collectively create value and seize growth and innovation opportunities. The notion of biological ecosystems as communities of interacting organisms situated in set geographic environments is a familiar concept to most people. Originally conceived by the British botanist Arthur Tansley in the 1930s, the term relays the continuous coevolution of organisms that adapt to external changes and disruptions sensed in their environment. During this evolutionary process, the various organisms influence each other (and their environment) as they create, compete, and share resources to survive (Kelly, 2015).

There are numerous types of ecosystems which co-exist and co-evolve within a certain environment, such as the Knowledge ecosystem, the business or innovation ecosystem, the natural ecological ecosystem, and the digital ecosystem (Peltoniemi and Vuori, 2004; Isenberg, 2011; Moore, 1993). In comparison with business ecosystems or innovation ecosystems the concept of Knowledge ecosystem is a relatively new one (Jucevičius, 2022). In the words of Reischauer et al. (2021), the Knowledge ecosystem has a particular feature in comparison with community characteristics for the innovation ecosystem, namely a more diverse sample of actors involved in such scientific activities. Yang et al. (2009) presented three common features of a Knowledge ecosystem which are similar to a natural ecological system: the presence of individuals and groups of individuals; the adaptation characteristic to a Knowledge ecosystem in continuous change and move; and the creation of social networks of cooperation and competition. It was documented before that the concept of Knowledge ecosystem is imported from the one of digital ecosystem (Bray, 2007, chapter 31). The reason for such approach is linked with the theory according to which a proper infrastructure within an organic self-organized structure or environment that favours innovation, (self)learning and human interaction is needed, being opposed to the mainstream top-down education system (Deparis et al., 2014). The static knowledge from knowledge management systems seems obsolete and needs to be reformed through a focus on dynamic knowledge (Scarlat et al., 2011).

Grounded in empirical evidence, we suggest that Knowledge ecosystems consist of users and producers of knowledge that are organized around a joint knowledge search. The concept of Knowledge ecosystem (KE) is used to define a system of interconnected components that work

together to create, share and use knowledge. It includes the processes, tools and platforms that support the creation, dissemination, and application of knowledge, as well as the cultural and social context in which this occurs. A Knowledge ecosystem's main attribute is to generate new knowledge and valuable open-ended solutions for the participating actors that drive innovation, improve decision-making and support learning and growth.

We consider KE as an active and dynamic system characterized by:

- Creation of knowledge;
- Intentional elicitation of knowledge;
- Ability to share knowledge across the entities.

**The ecosystem-level output** is generally research-based knowledge and associated applications, where the ecosystem actors jointly create and explore new knowledge as a shared resource. "Participation in the ecosystem also enables actors to purpose the primary acquired knowledge into new knowledge for commercialization of products or services or as a means to discover new business models or processes that they would not have been able to do if only relying on individual competences" (Clarysse et al., 2014).

Broadly speaking, a Knowledge ecosystem has many facets and definitions. Therefore, it is difficult to capture only one holist and comprehensive understanding of the concept. However, from the literature, a set of main attributes in defining Knowledge ecosystems have emerged: local universities and public research institutes are considered as central actors; it's an ongoing process that is constantly evolving to provide open-ended solutions and new knowledge; its main purpose is to achieve higher-order goals unattainable by individuals but through joint search and collaboration; Knowledge ecosystems can be seen as meta-organisations focused on knowledge-enhanced activities usually developed by actors located in closed proximity.

## 5.2 Stakeholders

The classic definition of a stakeholder is any group or individual who can affect or is affected by the achievement of the organisation's objectives (Freeman, 1984). The actors that encompass the Knowledge ecosystem can be divided into two categories:

- (1) The first category relates to entities, organizations, and individuals that contribute to the exchange, the exploration, and the building of the central knowledge base for shared use (contributors).
- (2) The second refers to members of the ecosystem who primarily belong to the ecosystem for the purposes of using the shared knowledge base for further innovation, market, or technological development (benefit members).

The two categories are not necessarily mutually exclusive, and contributors can become benefit members and vice versa. The actors also vary in terms of the roles that they need to fulfil, depending on the research request.

The legitimacy and the specialization of contributors as well as their networked connections are vital not only for the resources that they contribute toward the sustained exploration of

knowledge but also for the heterogeneity of the knowledge bases that they contribute. In turn, the benefit members of the ecosystem are often embedded in other ecosystems as well, be it business, innovation, or entrepreneurial ecosystems, which means that they have the ability to bridge the divide between knowledge “stock” and “flow”, which requires “new systems and understanding of the way in which [knowledge] can flow between diverse individuals, teams and organizations” (Archer-Brown and Kietzmann, 2018, p. 1290).

The main categories of KE stakeholders are:

- Universities and Research Entities (e.g. Universities/ University Alliances/University Associations, Research Institutes/ Researchers communities/ Public research institutions, Research Camps, Industrial parks, Research Centers/Hubs or Think Tank, Research clusters/platforms);
- Local and Regional authorities (e.g. Local and Regional Public Administration/Authorities, County councils, Representatives of municipalities, local government bodies; Public institutions; Social assistance services, Local authorities for social protection and rights, Public Health authorities);
- Innovative start-ups (e.g. Innovation Associations/ Programs, Bootcamps, Entrepreneurs, Unicorns, Spin-offs);
- Venture capital, sponsors (Regional agencies, Consulting companies/agencies, Start-up Nation, Investment groups, Business solution groups, Tech investors);
- Service organizations (Non-governmental organizations, Local and regional communities, Professional associations, Hospital research centres and institutes, Private hospitals);
- Incumbent firms (Entrepreneurs, creditors, investors, local and regional enterprises, Companies/Corporations, Private entities with R&I activities);
- Citizen Science Entities (European Citizen Science Association (ECSA), NGOs, Academia, citizen scientists).

### The main roles of stakeholders

- **Developers** are the inner core of social innovation initiatives, initiating and operating the solution. These actors are seen as being able to translate knowledge about unsatisfactory circumstances into an innovative idea in order to improve the situation. Furthermore, these actors can not only invent but also develop and implement the idea to make it a social innovation.
- **Promoters** of social innovations are involved in social innovation processes as partners that provide infrastructural equipment, funding, and connect initiatives to superior policy programs.
- **Supporters** refer to actors facilitating the spread and diffusion of social innovations through, for example, dissemination or lobbying activities.
- **Knowledge providers** - category devoted to actors that provide special knowledge relevant to spur and enrich the development process.

**Table 1** presents the main stakeholders' categories and their roles in the local/regional Knowledge ecosystem.

Nr.crt.	Stakeholder group	Representatives	Role in the Knowledge ecosystem
1.	Universities and Research Entities	Universities/ University Alliances/Associations, Research Institutes/ Researchers communities/ Public research institutions Research & Industrial parks Research Centers/Hubs or Think Thank, Research clusters/platforms	contributors
2.	Innovative start-ups	Innovation Associations/Programs/Bootcamps, Entrepreneurs	contributors
3.	Local authorities	Regional Agencies, Local Public Administration, County councils, Representatives of municipalities, local government bodies; Public institutions; Social assistance service, Local authorities for social protection and rights, Public health authority	contributors & benefit members
4.	Venture capital, sponsors	Regional agencies (ADR-NE), Consulting companies/agencies, Start-up Nation, Investment groups, Business solution groups, Tech investors	contributors & benefit members
5.	Service organizations	Non-governmental organizations, Local and regional communities, Professional associations, Hospital research centers and institutes, Private hospitals	contributors
6.	Incumbent firms	Entrepreneurs, creditors, investors, local and regional enterprises, Companies/Corporations, Private entities with R&I activities	contributors
7.	Citizen Science Entities	European Citizen Science Association (ECSA), NGOs, Academia; citizen scientists	contributors & benefit members

**Table 1. Stakeholders' roles in the Knowledge ecosystem**

Among the types of relationships between the stakeholders involved in the Knowledge ecosystem the following were identified: cooperation, collaboration, reporting, involvement, expertise providers, support, and, supply (Maglyas and Smolader, 2014). Involving citizens in producing data can help experimenting with new forms of participation and governance which, in turn, may lead to new types of relationships between citizens and public institutions (Ruppert et al., 2017). This argument resonates with the argued-for need for governance systems involving multi-stakeholder collaboration (British Academy and Royal Society, 2017).

### 5.3 Citizen Science

Citizen Science is generally defined as a form of public participation in research projects through which citizens are involved in different stages of the scientific research process. This involvement can range from being better informed about science, its results and its impact on society in a broad sense, to participate in the scientific process itself, by observing, collecting, identifying, processing and analysing data, but also by financing scientific research projects/activities. Citizens, as main actors in the Knowledge ecosystem, decide how to get involved based on personal interest, time and technological resources.

Citizen Science approaches are used to address issues requiring a higher degree of engagement and participation from different stakeholders, leading to collaborative practices and alternative solutions to address common challenges and needs. Citizen Science is often performed in self-organized and self-sustained Communities of Practice (CoPs), networks of common interest, and shared platforms (Manzoni et al., 2021). Citizen science represents scientific works that require a higher degree of engagement and participation from different stakeholders, leading to collaborative practices and alternative solutions to address common societal challenges and needs.

In the last decade, citizen science, which can be characterized in many ways, has received increased attention among scientific institutions and the general public. Citizen science is a multifaceted concept that reduces the distance between science and society, contributing to the achievement of an inclusive society. Citizen science refers to the active involvement of the general public in scientific research tasks. This collaboration between scientists and citizens aims at producing new knowledge which can play a significant role in developing society, improving communities, and promoting public participation (Vohland et al., 2021). The higher awareness of the role of research and innovation and the precious contribution from society has the potential to improve the outcomes and reinforce societal trust in science (European Commission, 2021c). However, the development and implementation of Citizen Science depends not only on public and scientific perception but also on policy development, support and framing of the process (Hecker et al., 2019).

For increasing societal engagement in R&I processes and with the purpose of making this engagement successful, it is necessary to build strong partnerships between various stakeholders and to create proper structures and mechanisms. By including citizens in policymaking processes, they can have a sense of ownership of the suggested solutions and can feel that they create the kind of environment in which they wish to live now and in the future. Also, meaningful social engagement could be achieved by using proper incentives, which can be used as a stimulus for societal engagement in R&I for scientists.

## 5.4 Civic engagement

Citizen and public engagement are not new concepts. The idea behind citizen engagement is that citizens should participate in the deliberations over the decisions that affect their lives. Yet civil society engagement has often been considered as an energy- and time-consuming activity that requires substantial effort and motivation from public institutions, balanced with a profound commitment by citizens. Considering these factors, in the past engagement has been pondered in regard to the investment it requires. Yet, growing evidence confirms that under the right conditions, citizen engagement can help institutions to achieve several objectives: informing the design of a reform program, improving implementation effectiveness and improving the monitoring and evaluation of reform programs. These benefits can be clustered according to three layers of impact:

- **Instrumental.** The direct benefit in terms of the instruments, policies and practices of policymakers, on how they go about the process of achieving innovation. This is the more practical and immediate benefit of citizens' engagement with the output of the policy cycle and specifically interacts within the process of decision-making.
- **Conceptual.** The benefit in terms of a better understanding of the subject matter. Firstly, the extent to which policymakers better understand the context and reality of the scenario of action, the behaviours, the aspirations, and the constraints of the social system. Secondly, the extent to which citizens understand the dynamics, thinking and impact of programs, beyond their individual perception. In this perspective, public engagement becomes a process of sense-making, through the integration of multiple perspectives through participatory interpretation. The dynamics here are iterative and heuristic, through a continual process of evolving inquiry and action.
- **Capacity building.** The benefit in terms of strengthening the ability of citizens and policymakers to work together towards implementation of the actions. Engagement here is a bidirectional relationship, leveraging networks of people and organizations able to actually act and change systems. Citizens become part of the instruments, not only informants. This is a much deeper and more broad-based impact, which takes on a life of its own even after the instruments are discontinued (RISE Group Research, European Commission, October 19).

Our policy paper is based on the following premise: to measure citizens' involvement in R&I activities you need to consider not only the determinants factors for the citizens' involvement but also the impact of public engagement for the Knowledge ecosystem.

### Civic engagement's indicators

People's civic engagement means overstepping the deficits that appear in the relations between society and science with the purpose of achieving a democratic decision-making process and sharing responsibility. The Flash Eurobarometer (FL4023) from 2020 commissioned by the

European Parliament implemented a survey for measuring people's civic engagement. According to the results of the survey, almost half (47%) of the citizens from Europe declared their personal engagement with Civil Society Organizations in their country. 51% of the respondents declared that they are not engaged with Civil society organizations. The results showed that 27% said that they donate money to Civil society organizations, 16% declared that they are actively encouraging other people to engage with these organizations, while 15% declared that they have regularly volunteered to take part in various activities for these organizations and a similar percentage said that they have taken part in demonstrations or similar activities organized by Civil society organizations. Analysing the results by country, between 30% and 77% of the respondents are not civically engaged. The countries with the most civically engaged people are the Nordic countries, while the countries of Central and Eastern Europe are the ones with the lowest percentage of civically engaged people.

The survey also analysed the motives that would stimulate active citizenship. Focusing on the three most important motivations; it is possible to observe that 33% of all the respondents sustained that their involvement with Civil society organizations would increase if they were convinced that their engagement would have a real impact. 25% said that they would be motivated by knowing that their financial engagement will be used by Civil society organizations, and 19% would be motivated if they could participate in concrete activities or projects organized by these organizations.

Flash Eurobarometer 2020 also measured the participation in public consultations at the local level by country. Almost half (45%) of the people interviewed said that the city, town or village where they live had a public consultation in the last 12 months, where citizens could get involved in discussing or making decisions about what is happening in their area. A similar percentage (45%) of the respondents declared that there has never been a public consultation in their area. Even in the areas where such consultations were organized, only 16% of the respondents took part in those events.

Regarding the usefulness of public consultations, 72% of those who were at least aware or participated in such events considered them to be a good way to give citizens a say in formulating local policies.

In addition to measuring these aspects related to people's civic engagement through surveys, series of indicators were also used by the European Commission, in a study from 2015. These indicators for measuring the civic engagement of people are participation in formal or informal voluntary activities, which express active citizenship by gender, age and educational attainment level and also by income, household type and degree of urbanization. Moreover, there are a couple of indicators that measure the reasons for non-participation in formal or informal voluntary activities, related to variables such as sex, age and educational attainment level but also by income, household type and degree of urbanization.



Analysing the above-mentioned indicators for the case of European Union countries, we observe that, in 2015, the share of the population aged 16 and over that participated in active citizenship was 18.9%. The lowest level was registered in Romania (3.2%), and the highest value of 48% in Norway. Moreover, a slightly higher share of women (19.6 %) were active citizens compared to men (18.2 %). In addition, people with a higher level of education and those which are situated in the top income quintile had the tendency to participate more than average in active citizenship.

Looking at the age of citizens with the highest share of active citizens in the EU was recorded for the age group 50-64 years (13.3%) very close to the age group 35-49 years (13.1%). The lowest share was registered for the age group of 75 years and over.

## 6. Methodology to identify local stakeholders

The seven universities composing the Alliance of European Universities “EC2U”, rooted in the dialogue between universities and cities, are again joining forces to extend the activities of the EC2U Alliance to the R&I fields. Their goal is to transform the EC2U Alliance into the core driver of a Pan-European Knowledge Ecosystem (PEKE) via a series of well-thought activities with relevant (local) stakeholders. The targeted systemic impact will create a fully-embedded synergy between all four missions of the Knowledge square.

In order to identify local Citizen Science Champions, an online questionnaire-based survey was conducted with the representatives of the 7 stakeholder categories from the EC2U alliance – European Campus of City-Universities. We established a double set of criteria (quantitative and qualitative) to identify the actors and capacities involved in promoting and implementing R&I.

The following criteria were considered:

- Background involvement in R&I activities
- Research and Innovation declared as activity object (e.g. NACES/ CAEN codes)
- Previous participation in R&I programs or projects
- Previous cooperation with research entities
- Budget allocated to R&I activities

**Table 2** below lists the two categories of selection criteria of the stakeholder's representatives involved in Research & Innovation activities.

Quantitative Criteria	Qualitative Criteria
<ul style="list-style-type: none"> <li>➤ Background involvement in R&amp;I activities</li> <li>➤ Number of R&amp;I programs or projects carried out</li> </ul>	<ul style="list-style-type: none"> <li>➤ Role and impact of stakeholders' research related to local initiatives</li> <li>➤ Engagement type: instrumental, conceptual, capacity building</li> </ul>



<ul style="list-style-type: none"> <li>➤ Budget allocated to R&amp;I activities</li> <li>➤ Number of activities carried out for increasing public engagement in R&amp;I</li> <li>➤ Cooperation with other entities in R&amp;I activities</li> <li>➤ Level of activities performed: local, regional, national, international</li> </ul>	<ul style="list-style-type: none"> <li>➤ Main roles: developers, promoters, supporters, knowledge providers</li> <li>➤ Added value/societal impact of previous projects involving citizen science, with regard to policy, learning, and triggering social innovation.</li> </ul>
--	--

**Table 2. Selection criteria**

## 7. Characteristics of the local/regional knowledge ecosystems

The deep understanding on how a local Knowledge ecosystem is functioning is an absolute pre-requisite to the connection of the seven ecosystems into a single Pan-European Knowledge Ecosystem (PEKE). Based on the data collected from the seven Universities of the RI4C2 Alliance, the following aspects will be presented in this section:

- The Vivid Local Knowledge ecosystems and their characteristics (cooperation mechanisms, significant topics, civic engagement);
- The challenges regarding cooperation among stakeholders and how they tackled or intend to tackle these challenges;
- Best practices and lessons learned;
- Best cooperation instruments among stakeholders;
- Indicators of people's civic engagement, and specifics measurement instruments of civic engagement.

Our analysis is based on a survey-based questionnaire and a focus group/workshops/debates/discussions/interviews/meetings that addressed the concept of Knowledge ecosystem and its implications, which were organized in the seven partners involved in the RI4C2 Alliance: the University of Poitiers, the University of Salamanca, the University of Coimbra, the University of Pavia, the University of Jena, the University of Iasi, the University of Turku.

The survey has been released in August 2022 and has received an impressive number of completions attempts. However, the final form has been achieved by 107 respondents distributed per Alliance countries as presented in the **Table 3** below:

Countries	Answers	Academic Universities Research and Innovation	Innovation start-ups	Local authorities	Venture capital, sponsors	Service organisations	Incumbent firms
DE	7	7					
ES	20	13	1	2		1	3
FI	4	4					
FR	29	19	2	1	1	2	2
IT	2		2				
PT	19	14				4	
RO	26	10	2	8		6	

Table 3. Number of respondents by countries and stakeholder category

**Figure 2** contains the representation of the stakeholders by colour emphasizing the better receptivity from the academics, universities and research institutes to answer to the survey. The higher appetency of the first stakeholder category was observed from all the countries involved in the survey. Another remark is related to the distribution of answers and it can be observed, even if a significant number of responses were not reached for each entity, that France has at least an answer for each stakeholder category and Romania has a significant number of answers for a representative perspective for at least three stakeholders.

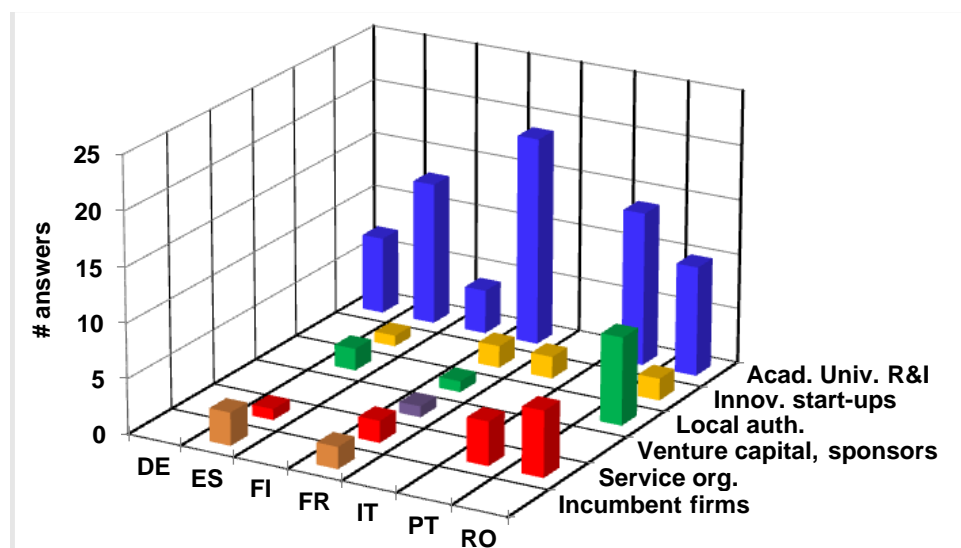


Figure 2. Number of answers distributed by stakeholder categories and countries

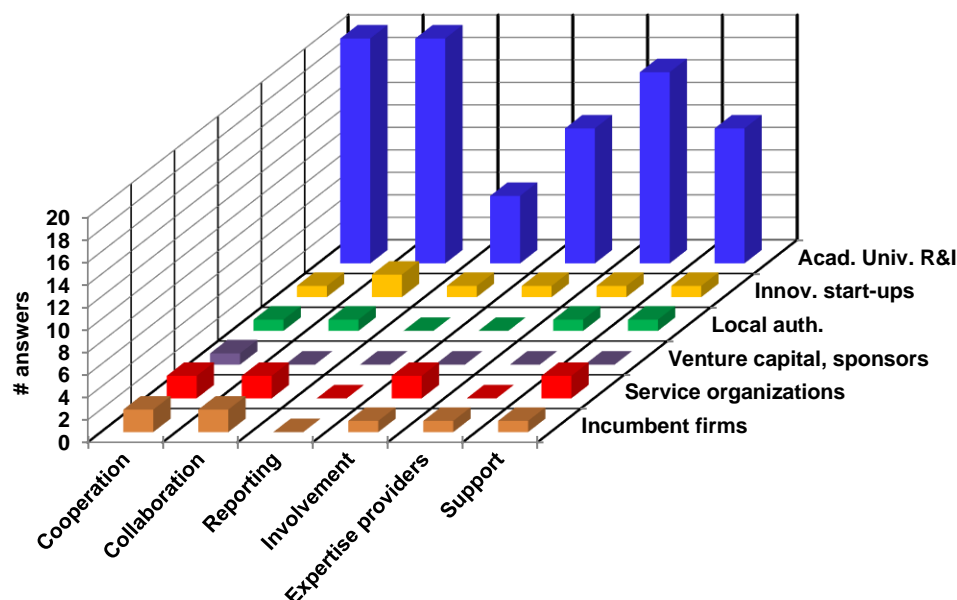
In the next section, the characteristics of the seven local Knowledge ecosystems of the RI4C2 Alliance will be outlined. The data presented are based both on the responses received to the questionnaire and on the results of the focus group/debate organized by each university.

## UNIVERSITY OF POITIERS

**The Knowledge ecosystem in Poitiers** consists of different actors like the University of Poitiers, associations (for example Les Petits Débrouillards, Fablab La Fabrik, Espace Mendes France, Technopole Grand Poitiers etc), private companies (BPI France, Eurofins, Schneider electric, Bbraun, Safran Electronics & Defence, Odéys etc.) regional and local authorities (Grand Poitiers, Ville de Poitiers, Région Nouvelle Aquitaine), research entities (INRAE, CNRS, Inserm) and citizens of Poitiers.

The **main cooperation mechanisms** include organization and participation in the events like 'Fête de la Science' which was organized in close cooperation with government authorities on the local, regional and national levels, local and regional associations and the University of Poitiers. The event attracted a lot of citizens and popularized science in Poitiers. Additionally, local actors organize many common projects with and for society, workshops for other stakeholders and citizens. For example, the Technopole de Grand Poitiers proposes workshops and network events for other companies and start-ups in cooperation with other key actors like the regional authority Région Nouvelle-Aquitaine.

The diagram in **Figure 3** illustrates the primary methods of cooperation among the diverse groups in Poitiers, such as collaboration, reporting, involvement, expertise providers, and support. Additionally, it indicates the most frequently used mechanisms of cooperation between these groups.



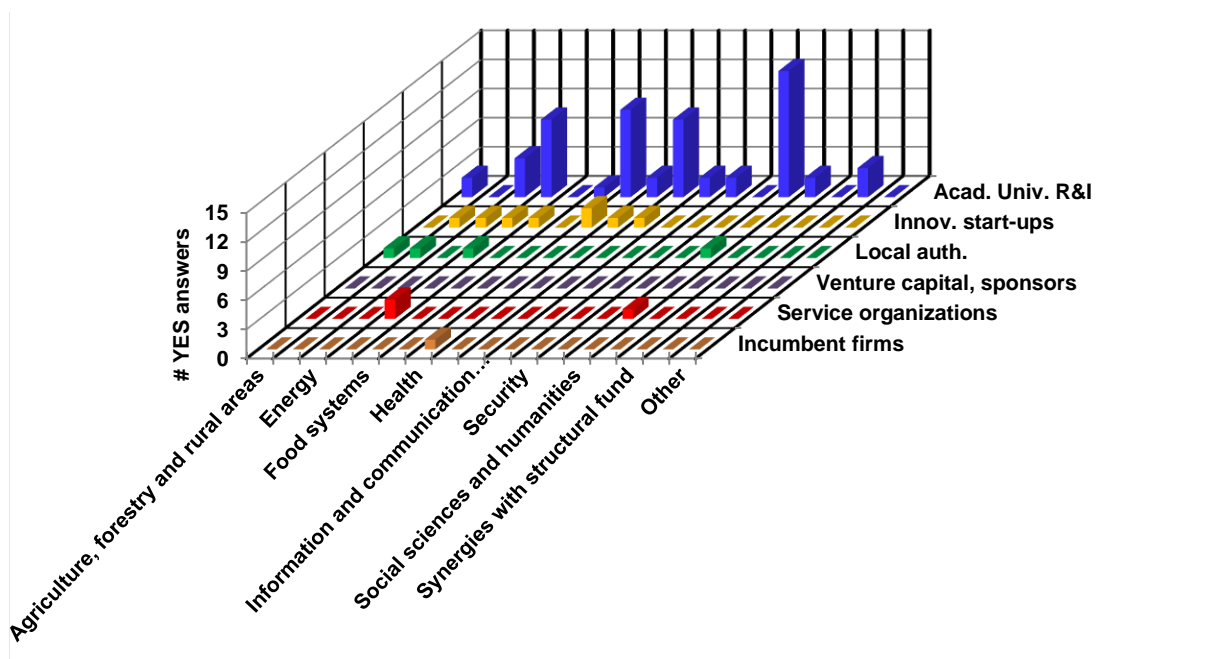
**Figure 3. Relationships with other entities involved in research and innovations activities**

Commonly, the activities of the Local Knowledge ecosystem are organized in cooperation with two or more key actors and cover a wide number of topics depending on the spheres of interest

and expertise of those key actors. These past few years, Sustainable development has been the main topic covered by the local authorities and entities since it derives from the municipal political guidelines of the local government. The University of Poitiers has defined four UN SDGs as **significant topics** – Health and Well-Being, Quality Education, Language and Cultural Diversity, Sustainable Cities and Communities, and Peace, Justice, and Strong Institutions as a long-term strategic direction. Furthermore, the University of Poitiers has outlined five federative research poles: Health and Biology, Law, Information Engineering Science, Energy and Environment, and Human Science.

The University of Poitiers is a key-actor in the development of the attractiveness of the local territories, so it actively collaborates with 13 regional research networks with different themes aimed to accelerate the technological transfer of the research results to society. These research networks cover four main areas: ecological and energy transitions, territorial development, health, digital transitions, and fostering a plural and creative society.

The diagram presented in **Figure 4** illustrates the primary themes of Citizen Science projects carried out by various entities in Poitiers. For instance, a significant number of Citizen Science projects focused on Social Sciences and Humanities were organised by the University and R&I entities.



**Figure 4. The main research and innovation activities/projects carried out by an entity**

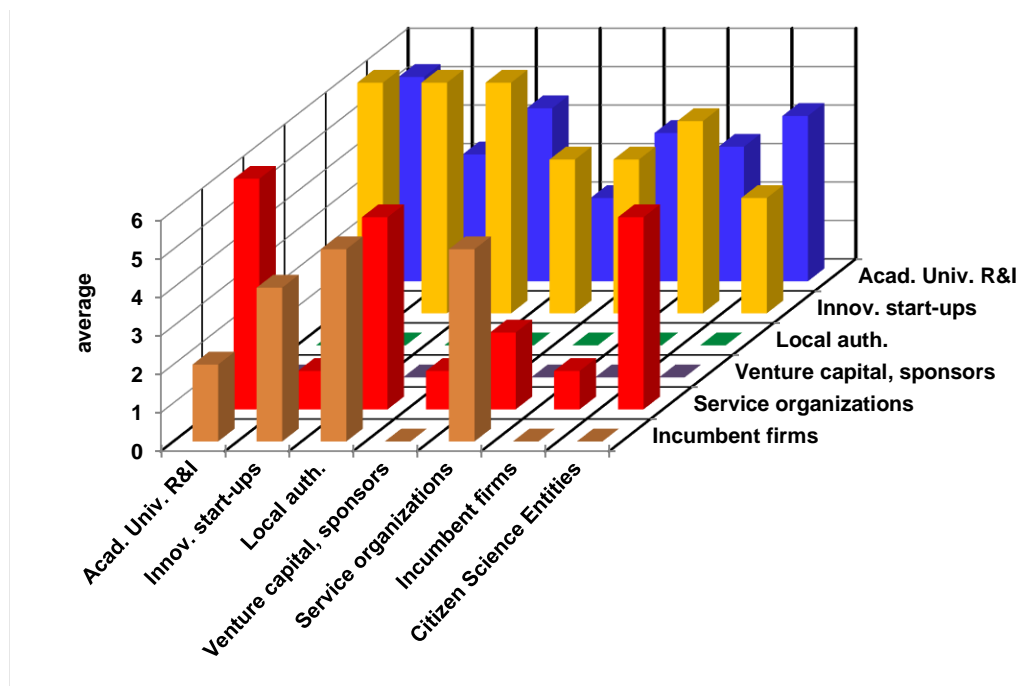
The University of Poitiers manages two Regional Innovation and Technology Transfer centres (digital education and health). The second example is CORDINA – an annual meeting of all the regional R&I entities where the participants present their R&I strategies.

At the local level, the networking between the key actors in Poitiers takes place in specific events (conferences, seminars, workshops, information meetings etc.) which are organized by the key

actors. For example, the private company Odéys organized an event to share the results of their work and invited local stakeholders who could be interested in that topic. One of the goals of such events is networking to facilitate the realization of any activities or projects. The cooperation networks are divided by spheres of expertise.

The instruments which are actively used are multiannual agreements with local authorities and organizations, and regional cooperation around particular topics (for example, cooperation dedicated to health, biodiversity, etc.). It helps to formalize the relations and specify a clear and detailed roadmap to reach common goals. In addition, these instruments help to consolidate and structure relations with local key actors.

**Figure 5** presents a Likert chart that showcases the level of cooperation between various entities in Poitiers. The chart employs a six-point scale where a rating of 6 indicates excellent cooperation, while a rating of 1 suggests very poor cooperation.



**Figure 5. Quality of cooperation with other entities in these research and innovation activities**

In theory, stakeholders are open to cooperation but face a number of challenges. The first one is a lack of employees who can be responsible for cooperation tasks such as communication plans, the concept development of the projects or any activities which can be completed together with other stakeholders. It relates specifically to research laboratories because some fields can be complicated and unique. It demands creativity to popularise it with citizens or create joint projects with stakeholders with no particular expertise. In theory, that obstacle can be overcome by defining a clear communication plan with realistic goals and employing staff with specific expertise in the area.

The second obstacle that logically derives from the first is stable networking; some stakeholders are very active in building strong relations, but others are not. However, it is necessary to mention that Poitiers is a relatively small town, so stakeholders who work in the same field know each other but those from different fields do not, so projects like 'Fête de la Science' can decide that challenge and bring together different key actors.

The key actors in Poitiers use **different instruments of civic engagement**. First of all, the sharing of information about current projects, events, and workshops are realised via the websites of the local stakeholders, television, and social media (Twitter, LinkedIn, Instagram, and Facebook). For instance, the office of the Scientific Mediation of the University of Poitiers uses television, social media and outdoor advertisement (posters and billboards) to share information about some of their events. Secondly, the organization of events in the city centre attracts people passing around and provides simple transport accessibility to increase the number of participants. For example, the 'Fête de la Science' was organised in the historic building in a famous square to attract people who might pass nearby and simplify the accessibility to visitors who potentially intended to participate in an event. Thirdly, some citizens voluntarily participate in the research because they are interested in the topic and connect with organizations directly via the contacts section on their websites. For example, in the laboratory of Palaeontology in the University of Poitiers, citizens can participate in research projects.

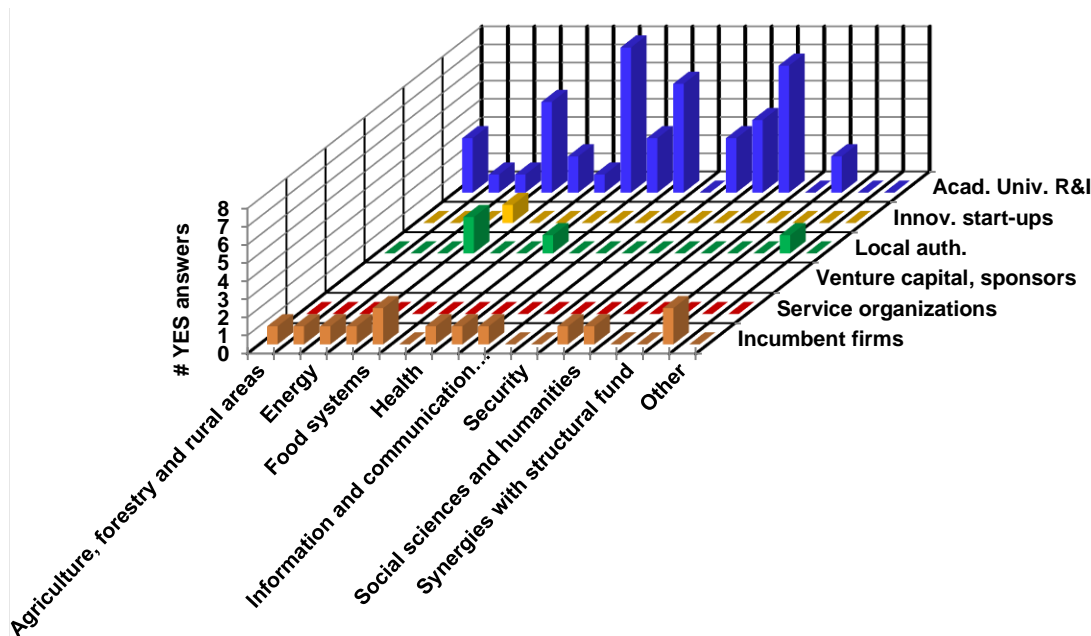
**Civic engagement** can be measured by engagement indicators in social media statistics, the number of participants in the event or the number of participants in a citizens science projects. It can be counted by different methods like the questionnaires measuring satisfaction after the event, direct counting by hand tally counters or subscription forms on the organizations' websites.

The new networks are a good practice to improve the cooperation between key actors. For example, a network like the Regional Innovation and Technology Transfer Centre costs 5000 euros for 18 months to organize conferences, seminars, and meetings. Afterward, it is necessary to consolidate and set-up the project, present it and validate it at the regional level. The main lesson learned is that it is important to sign the annual agreement to set and formalize the network. In addition, it is important to organize a collaborative network, for example through working groups, management committees, meetings and sharing of ideas and opinions, salons, workshops, fix the place for the reunions, regular presentation of the project advancement.

## UNIVERSITY OF SALAMANCA

The Knowledge ecosystem in Salamanca consists of different actors such a public university (USAL), a private university (UPSA), different research institutes connected to the USAL (CIC, IBFG, CIALE, ECYT) or to the CSIC (INRA), associations (ASPRODES), service organization ("Unity of equality between men and women"), transfer technologies entities (Scientific Park), start-up companies (Ocho Siglos Arribando SL), local and regional authorities (Salamanca city hall, JCYL) and Salamanca citizens.

These actors are involved in different activities, regarding diverse fields of research and innovation (please, see **Figure 6**):



**Figure 6. The main research and innovation activities/projects carried out by an entity**

- Health: universities and research institutes (CIC, IBFG, INCYL), USAL hospital.
- Culture and knowledge: city hall through “Salamanca City of Culture and knowledge Foundation”, USAL.
- Food and biodiversity of species: “Ocho Siglos Arribando SL”, CIALE, INRA, USAL.
- Human rights: “Unity of equality between men and women” from the USAL.
- Social support for minorities: ASPRODES foundation.
- Education at different levels from infants to elderly: USAL, “Salamanca city of culture and knowledge Foundation”.

Below we present the development of the different projects/activities where we describe the relationship of the stakeholders with other entities involved in research and innovations activities/projects (please, see **Figure 7**):

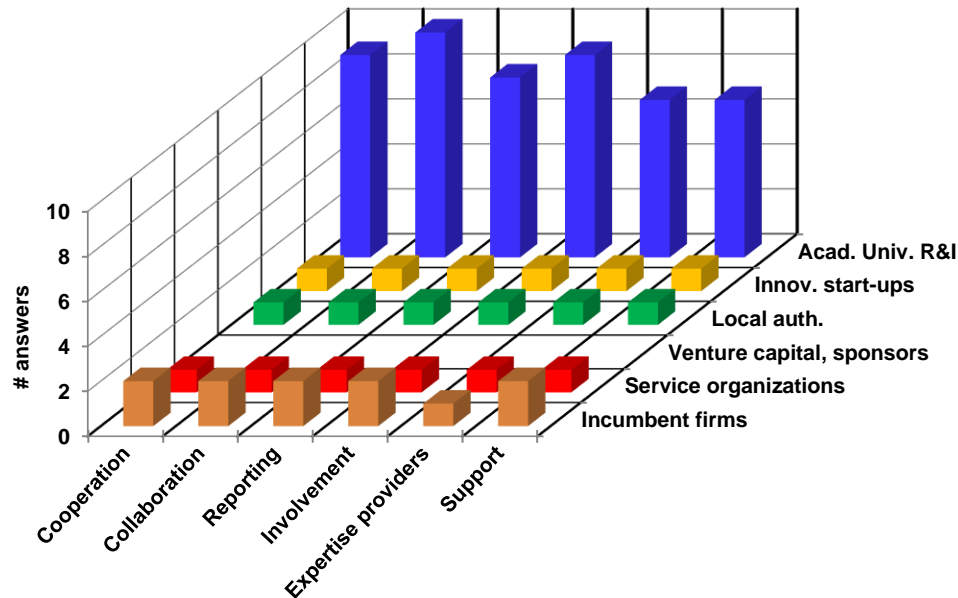


Figure 7. Type of relationships among entities involved in research and innovations activities/projects

And the Quality of cooperation with other entities in these research and innovation activities in the Knowledge ecosystem is illustrated in Figure 8:

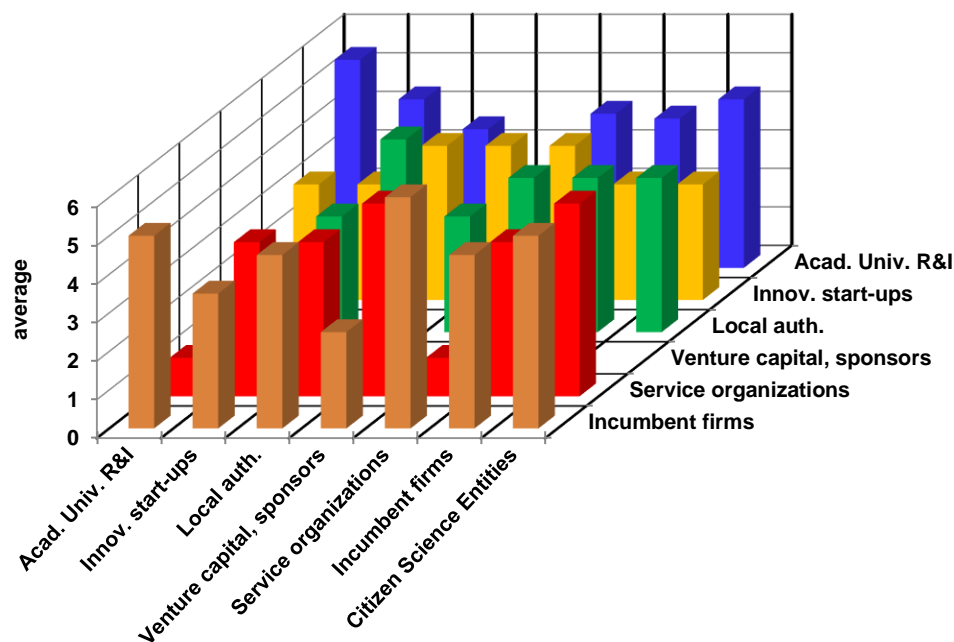


Figure 8. Quality of cooperation with other entities in these research and innovation activities



**Health:** there are different institutes, the USAL and the hospital that cooperates among them and with local and regional authorities as well as with citizens through different activities to promote health. These include: “The day of science”, “the day of women in science”, scientific fairs, etc. Local and regional authorities support these activities and award grants for research development.

**Culture and knowledge:** “Salamanca City of Culture and Knowledge Foundation” executes more than 300 activities per year. This includes theatre plays, dancing spectacles, visits to museums of scholars, conferences, book presentations, reading activities for children, adult formation activities (music, singing), etc. For this, the foundation cooperates with the university, local and regional institutions, parents, and any stakeholder interested in presenting an attractive proposal to promote knowledge and culture.

**Food and biodiversity of species:** There are different institutes involved in studying animal and plant improvement and biodiversity (CIALE, INRA). At the same time, the start-up company “Ocho Siglos Arribando SL” is dedicated to the study of the biodiversity of olive trees in a particular rural region of Salamanca. It is also involved in the production and commercialization of olive oil to potentiate the economy in this area and to prevent the exode of population from the countryside to the city.

This company engages the rural citizens of this area with the university which helps to analyse the different tree species. The local and regional authorities collaborate with the promotion of this company through financial subsidies and promotion activities.

**Human rights:** “The Unity of equality between men and women” is a service organization depending on the USAL which is in constant cooperation with the members of the university, official bar association, different women associations, especially those against gender violence, national and international universities as well as citizens. The Unity of equality organizes conferences, workshops, congresses, artistic exhibitions, etc. to promote the equality between men and women

**Social support for minorities:** ASPRODES is an association to improve the quality of life of people with intellectual disabilities and their families.

This association is involved in different citizen science projects such as “Barriólogos”, “Basuraleza” and “Príngate”.

“Barriólogos”: brings the scientific method closer to ordinary people and study the relationship between climate and the presence of plants and animals in the urban environments of the city. They work together with the technical support of the company “**Vive Ambroz**”.

“Basuraleza”: collection of garbage, debris and waste in nature in Salamanca and Béjar. These collections are always carried out jointly with different social entities in Salamanca such as: Plan B, Cepaim, Fridays For Future, among others.

“Príngate”: is a project that combines training, environmental education, community work, volunteering and networking where all the people who participate are an active part of the

organization. Príngate has generated a network of regular partners such as the María Auxiliadora de Béjar School, where environmental awareness talks are held.

**Education at different levels** from infants to elderly. The USAL is interested to promote education to children through summer courses for school students about robotics, about working in a laboratory and to adults through the “University of the experience”.

As we mentioned above “Salamanca City of Culture and Knowledge Foundation” promotes different educational activities for children and adults: book reading, book presentation, musical education, etc.

These activities involves the cooperation between the university, city hall through its foundation, schools and citizens.

**The challenge regarding cooperation among stakeholders** is the economic support, the lack of time and the lack of knowledge among the activities developed by the different actors. This can be overcome by information sessions to promote the enthusiasm between the different stakeholders.

The best **indicator of civic engagement** is to analyse the final product of each activity through the attendance of citizens to the different activities, through satisfaction surveys and the responses in social networks.

## UNIVERSITY OF COIMBRA

The Knowledge ecosystem of the Coimbra region is composed of several key actors (stakeholders). Among them, the University of Coimbra and its associated structures such as the Research and Development Center, the Science Museum, the Cultural Extension Units to support Education (UECAFs), among others. Outside academia, support structures for entrepreneurship, companies and regional development such as the Pedro Nunes Institute (an incubator), the Commission for Coordination and Regional Development (CCDR-C) and the Coimbra Region Intermunicipal Community (CIM) are part of this ecosystem. Entities such as the Coimbra City Hall and the Ciência Viva Centres – “O Exploratório” and “Rómulo de Carvalho” also play an important role, as they are a link to younger and older people, through the different activities they promote.

The various stakeholders belonging to this Knowledge ecosystem claim to have several relationships among them and that it can be established at different levels and typologies, namely, signing cooperation protocols, contractualisation, service provision, financing, mentoring, training, among others. The stakeholders characterize the relations that are established in the Knowledge ecosystem as being symbiotic relationships, being always beneficial for both parties, regardless of who initiates partnerships/collaboration/cooperation., as illustrated in **Figure 9**:

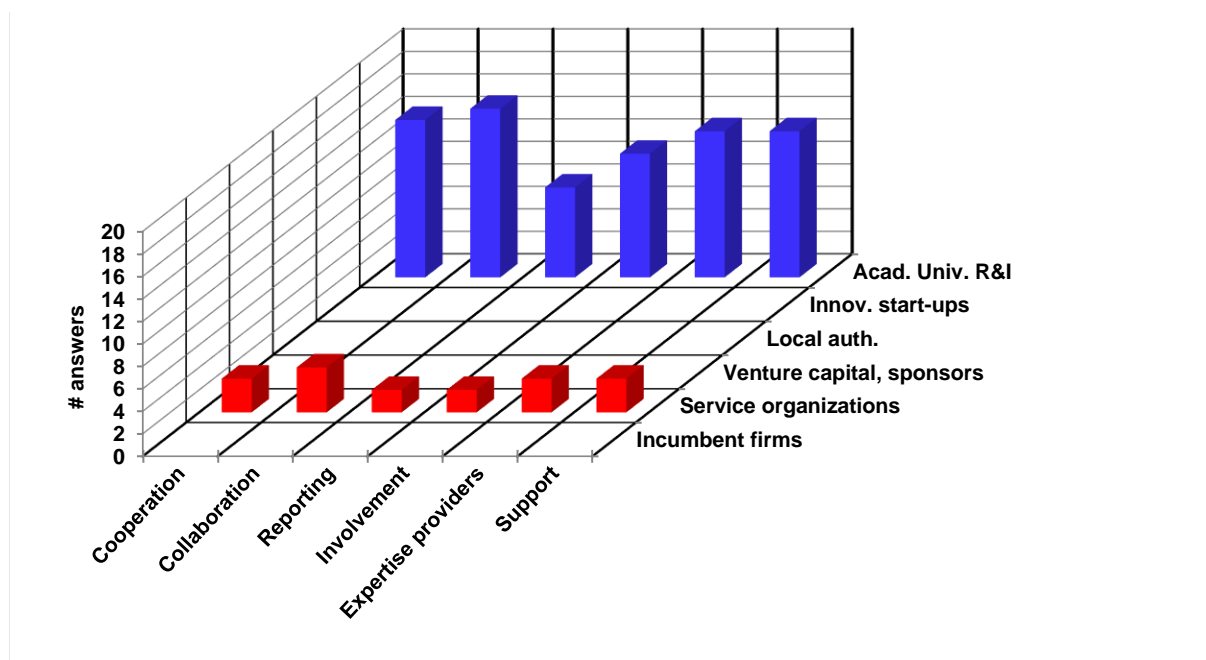


Figure 9. Type of relationships you have with other entities involved in research and innovations activities/projects

The stakeholders claim that there are no defined instruments to initiate cooperation. All agreed that it is in the identification of needs and in the search for solutions that the contact points emerge. That is to say that it is in the Ecosystem itself that specialized Know How is sought to solve the problems that certain stakeholders have identified and/or intend to solve, in different domains of activity, as specified in **Figure 10**:

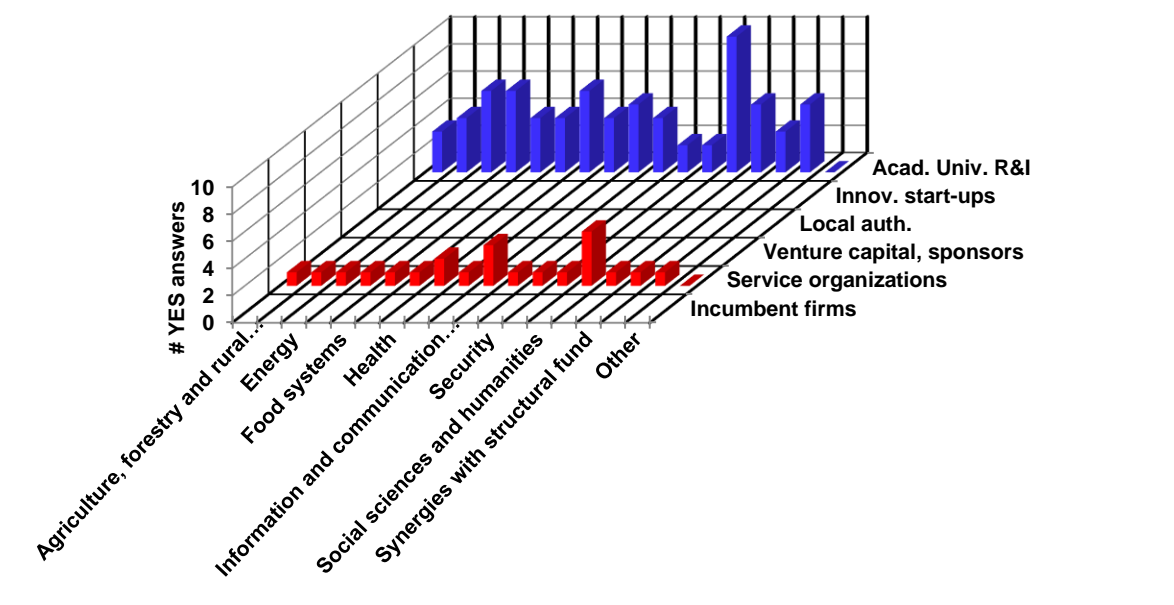
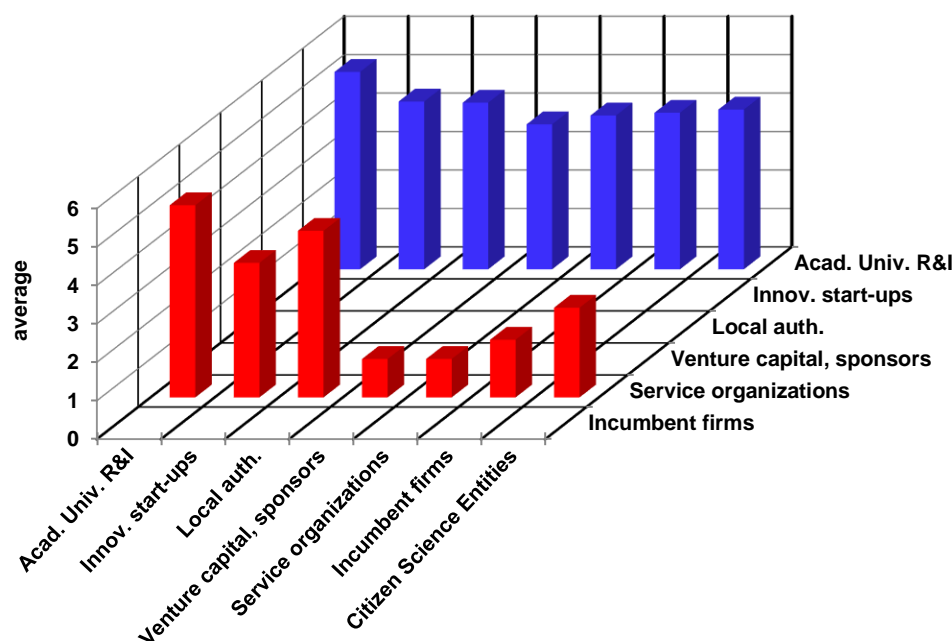


Figure 10. Main research and innovation activities/projects carried out by your entity

This Ecosystem is not static, because there is always the possibility of integrating new stakeholders to satisfy needs that have not been solved and/or identified so far.

Despite there not being a specific cooperation instrument identified, the various stakeholders mention that their openness to the establishment of new relations and the possibility of other agents integrating the Ecosystems is what makes it so valuable. It should also be added that this is one of the characteristics of Knowledge ecosystems that promotes the involvement of the whole community (please see **Figure 11** for details).



**Figure 11. Quality of cooperation with other entities in these research and innovation activities**

Research and innovation activities are generally considered channels of (new) benefits for the community and all are involved in these activities. Citizen participation in research and innovation activities has become a fundamental political priority, in particular through open science and citizen science policies. These actions should also be prioritized in the Knowledge ecosystem of the city, as Vice-Rector Delfim Leão states: “We need to map what exists, and honestly what exists is very little, that is, citizen involvement is much more from the perspective of the end receiver of something that is produced, and not someone who intervenes in the processes and stimulates them. It is necessary to involve citizens in all stages of the process and the scientific method”.

Citizen integration throughout the scientific and innovation process ensures that the concerns and interests of civil society are consistently understood and considered, and society also has an active and informed role in public decision-making. It should always be considered that the active participation of citizens in these activities should be voluntary and that it can be encouraged but not coerced. Secondly, this participation requires some form of action on the part of citizens, i.e. they cannot simply be passive recipients of knowledge and/or innovation. Finally, these activities

should be, as far as possible, strongly linked to the social mission, trying to find new solutions (products, services, models, etc.) that simultaneously meet society's demands and lead to the best use of existing goods and resources.

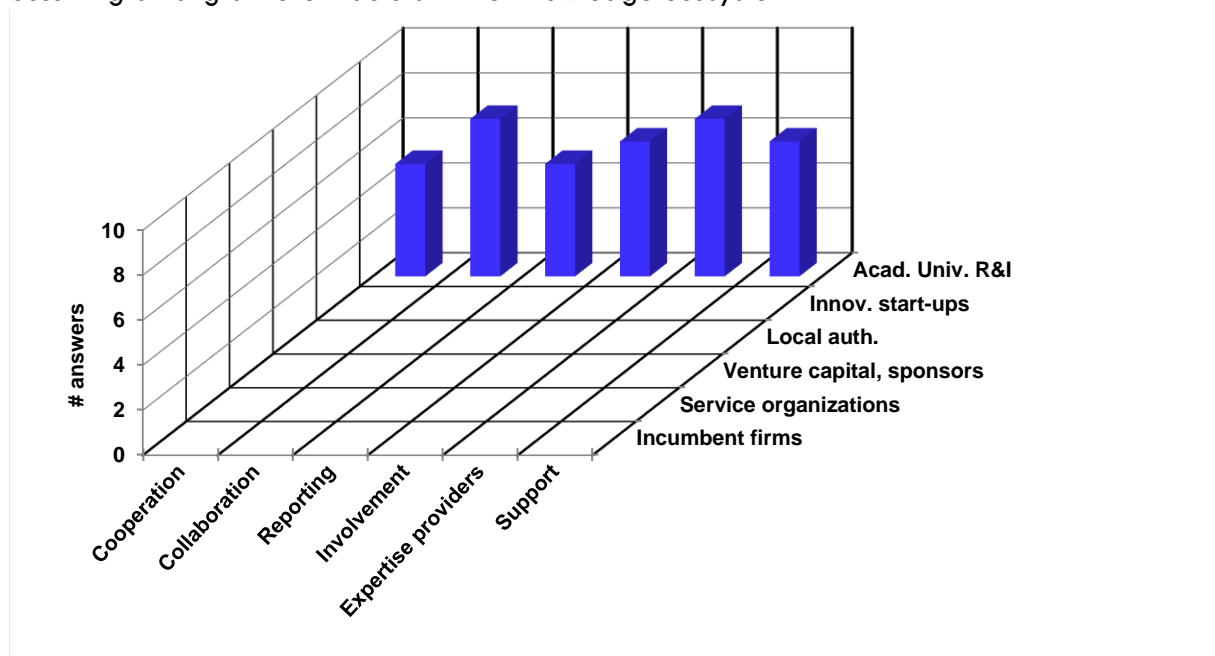
It was identified that the engagement of citizens in research and innovation activities enables large-scale learning and enhances peer-to-peer learning.

The lessons learned from the experience in the Coimbra Knowledge ecosystem reinforce the true necessity to bring science outside the University and make scientific language (more) understandable. Moreover, the technology should be further explained and accessible to all. At the same time, it is necessary that citizens challenge researchers, entrepreneurs, business owners and policymakers to reinvent the way they communicate their ideas and projects.

The symbiotic effect of these collaborations is thus revealed, as everyone benefits in some way, whether with greater scientific knowledge or with an easier way to communicate with the public. Therefore, improving the development of this region, in which all of us are beneficiaries.

## FRIEDRICH-SCHILLER UNIVERSITY OF JENA

In Jena, as in many city-universities, the university plays a central role in the Knowledge ecosystem. Not only as a whole, but also at the level of the smaller units, the research groups and service units, which are actively reaching out and connecting as well as attempting to collaborate with each other and the local stakeholders. **Figure 12** reflects type of relationships occurring among different actors in the Knowledge ecosystem:



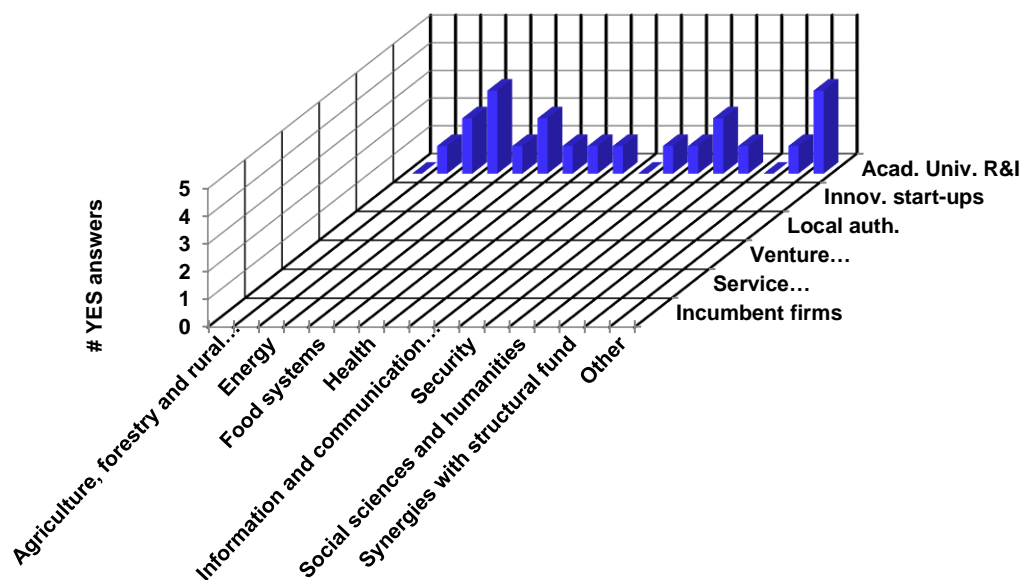
**Figure 12. Type of relationships you have with other entities involved in research and innovations activities/projects**

Some units serve as “hubs” that connect different actors in the Jena Ecosystem. For example, the Technology Transfer Office or the JenaVersum network knows many actors in the ecosystem,

connect people and organize networking events and other formats for exchange and collaboration.

In single research projects, the level of connections to local stakeholders varies depending on the topic and the research approach (as illustrated in **Figure 13**). Here are two examples:

- One researcher does a health study and needs to reach out to students and employees and connect to other service units.
- Another researcher just recently came to Jena and is writing an academic book. He is rather isolated and has no special connection to the wider Knowledge ecosystem, only to the specific (international) research community and his own supervisor.



**Figure 13. Main research and innovation activities/projects carried out by your entity**

Best practices (with quotes from the focus-group participants):

- Communicate the value: “Shows the advantages for all groups of actors and together perhaps also define goals, how you want to achieve them and in such a way that they are also taken along in this process – with the ecosystem behind the goals.” (Focus-group participant)
- Use multipliers and existing networks and clusters: “Individual people have emerged who could then practically take on such a multiplier role, so that we have contact with the various departments, faculties and so on. It works a lot via the contacts we already have. And the word of mouth.” (Focus-group participant)
- Use different formats of communication. Institutionalise exchange. Show presence, visit each other. Take time to build trust: “[...] the exchange, to bring people into conversation. I think that's already an added value for Jena. Simply to bring actors from the different spheres, who otherwise do not have so much to do with each other or from the various

institutions, into conversation and exchange information, without anything being created for now". (Focus-group participant)

- Beyond networking, co-create: "So not only to highlight topics, but also to enable interactive formats, co-creation, in order to pursue goals together or to achieve goals". (Focus-group participant)

In **Figure 14** there are presented the quality of cooperation among other categories of stakeholders in the research and innovation activities:

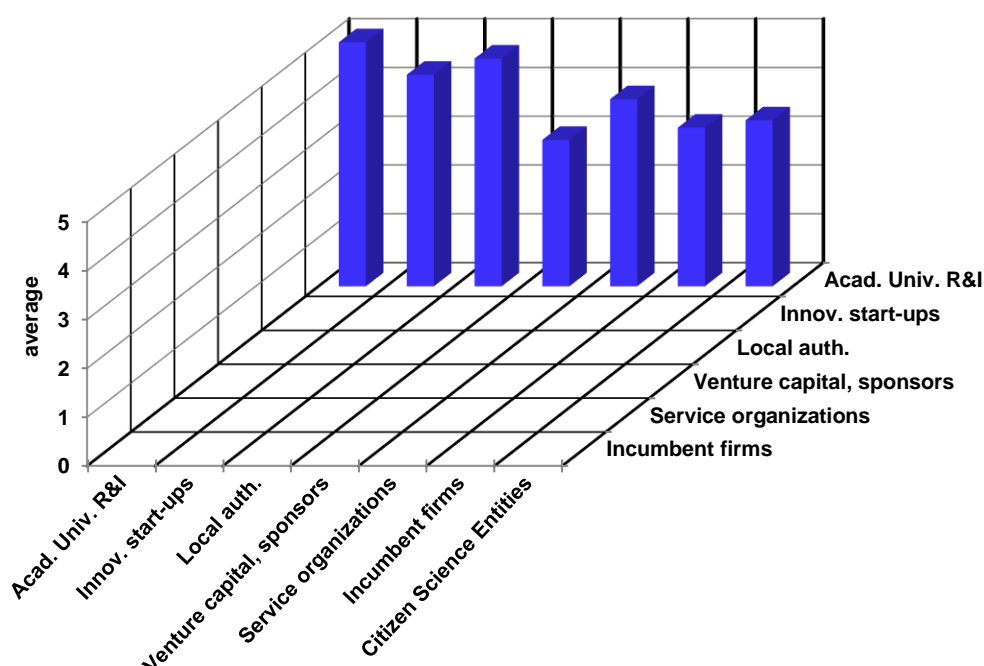


Figure 14. The quality of cooperation with other entities in the research and innovation activities

## ALEXANDRU IOAN CUZA UNIVERSITY OF IAȘI

The Knowledge ecosystem in Iași consists of different actors such as public universities (UAIC, USAMV, UMF etc.), research institutes (ICI, IFT, ICES etc.), private companies (Continental), incumbent firms (Antibiotice), local and regional authorities (Iasi Hall, Local council) services organizations (Bethany), transfer technologies entities (E-Transfer, Research As A Service) and citizens of Iași.

General characteristics of the Romanian local Knowledge ecosystem related to the Iași area:

- Absence of a local/regional strategy for the development of a knowledge system;
- Absence of specific cooperation instruments among different categories of local/regional stakeholders;
- There are no indicators to measure the specific needs of different categories of stakeholders;

- Some key-terms suggested by stakeholders to characterise the Knowledge ecosystem: people, relationships, nodes, resources, dependency relationships, involvement;
- The need to participate in local governance decision-making;
- Isolation tendency of the local/regional business environment from the policy makers/political environment.

Issues highlighted by focus-group participants:

- The need to identify the common needs of different categories of the local stakeholders in order to develop a strategy for the local Knowledge ecosystem;
- The role of nodes/mediating entities held by some stakeholders within the local Knowledge ecosystem (e.g. knowledge transfer centers);
- The need to develop digital platforms to support collaborative relationships between different categories of stakeholders;
- Identification of funding sources/instruments to support the participation of different stakeholders in the R&I activity.

The distribution of the local entities is structured as follow (based on 26 answers from Romania):

- Local level activities = 8 entities
- Regional level entities = 4
- National level activities = 8
- International level activities = 6

A very heterogeneous distribution could be observed with entities having a spread territorial activity and some others with a focus on local and regional feedback.

Most of the local entities have activities performed with other entities from the local ecosystem: from 26 respondents 22 declared research and innovation activities/projects with other entities.

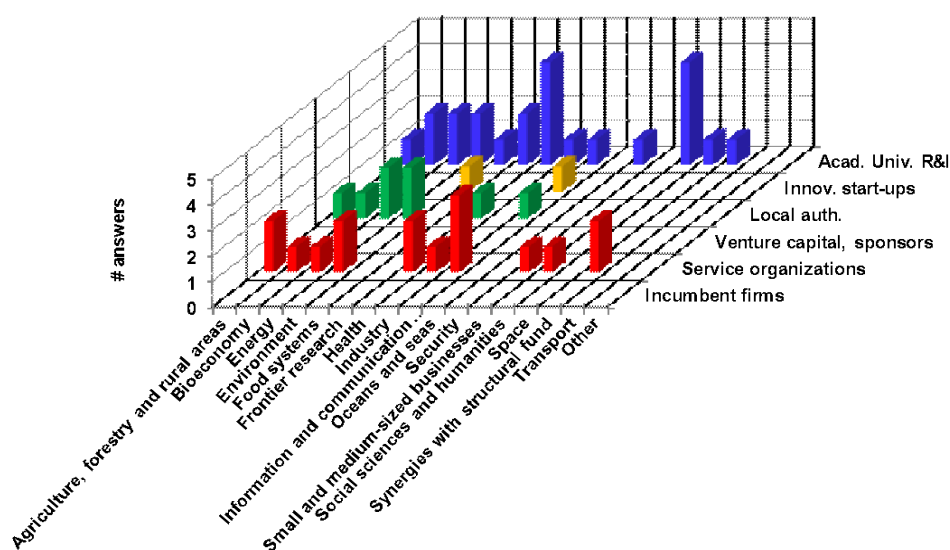


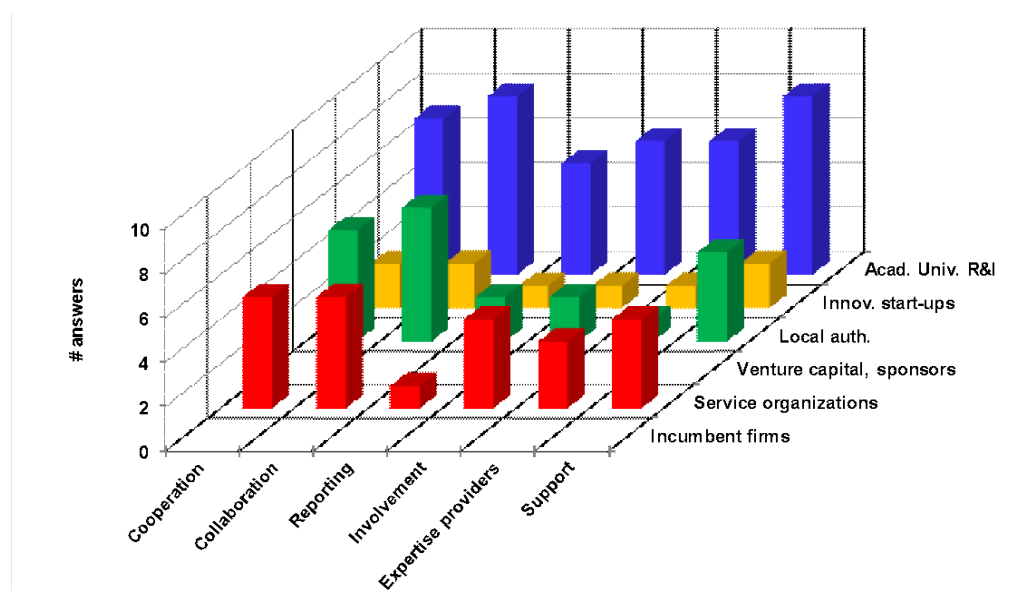
Figure 15. The main research and innovation activities/projects carried out by your entity



The stakeholders from the Iași local Knowledge ecosystem are involved in various activities structured as follow: Agriculture, forestry and rural areas; Bioeconomy; Energy; Environment; Food systems; Frontier research; Health; Industry; Information and communication technologies; Oceans and seas; Security; Small and medium-sized businesses; Social sciences and humanities; Space; Synergies with structural fund; Transport; and other fields of research (please, see **Figure 15**).

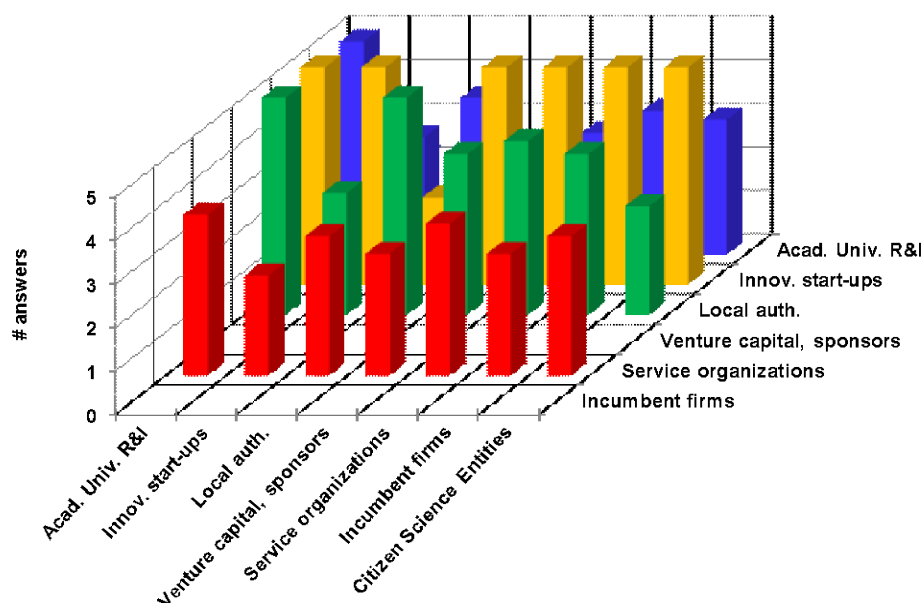
Most of the answers regarding the Iași ecosystem were received from the Universities and Research entities, Local authorities and Service organizations. The stakeholders could select from the survey multiple activities in which they were involved. The analysis on “II.7” (dealing with the main research and innovation activities/projects carried out by the respective entity) has shown that none of the stakeholders is involved in all the selected activities while some of them are involved in only one activity. However, some respondents were not involved in the activities available in the provided list and have selected other activities from where it could be mentioned: cyber security, veterinary imaging, aquaculture, education and public safety and security.

The figure below (**Figure 16**) evaluates the cooperation, collaboration, reporting, involvement, expertise providers and support of the respondents with other entities involved in research and innovation activities.



**Figure 16. Type of relationships you have with other entities involved in research and innovations activities/projects**

**Figure 17** is representative for the quality of cooperation of local stakeholders with other entities from local/regional Knowledge ecosystem corresponding to Iași area:



**Figure 17. The quality of cooperation on average of local stakeholders with other entities from local Knowledge ecosystem**

Table 4 presents the average score quantitative evaluation of the cross cooperation within the stakeholders' categories. The cooperation within entities as exemplified for the Iasi local Knowledge ecosystem was evaluated from 26 answers excluding the "not answer" respondents.

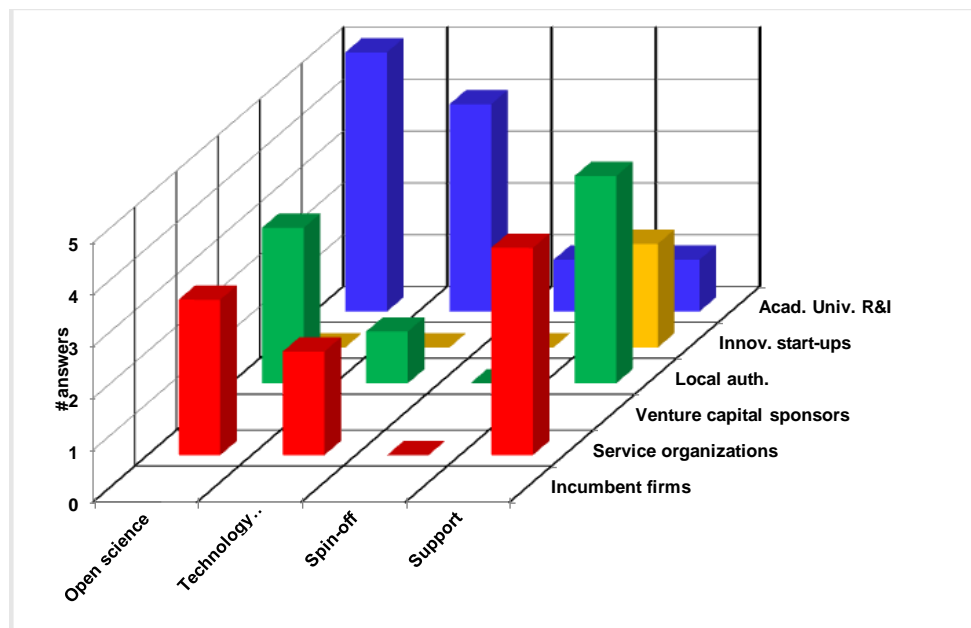
	Acad. Univ. R&I	Innovative start-ups	Local authorities	Venture capital, sponsors	Service organizations	Incumbent firms
Acad. Univ. R&I	4.9	5	5.2		3.7	
Innovative start-ups	2.7	5	3.7		2.3	
Local authorities	3.6	2	5.0		3.2	
Venture capital, sponsors	2.2	5	3.7		2.8	
Service organizations	3.3	5	3.7		2.8	
Incumbent firms	2.8	5.5	4.0		3.5	
Citizen Science Entities	3.1	5	2.5		3.2	

**Table 4. Average score quantitative evaluation of the cross cooperation exemplified for Iasi Knowledge ecosystem**

The answers have been selected from respondents who evaluated quantitatively on a scale from 1 to 6 the quality of cooperation. The average was not attributed to the total number of 26 respondents but instead has been considered only for the respondents answering YES to specific type of question. From the total of 26 respondents, distributed as represented in **Figure 17**, Universities and Research Institutes have 10 answers, as the best represented category of stakeholders. Analysing those answers, we can figure out that there is a very good cooperation with entities with similar activities where a quality of 4.9 out of 6 was considered. Relatively good cooperation from Academics, Universities and Research institutes has been evaluated for Local authorities but also with citizen science entities. Less than half of the score has been

attributed to the cooperation with innovative start-ups, incumbent firms and venture capital and sponsors entities, the latest receiving 2.2 out of 6 from the survey average evaluation. From figure 5 and table 4 could be easily observed that service organizations very positively appreciate the cooperation with universities and research institutes as the score shown an average of 3.7 out of maximum 6 mark. Similarly, good cooperation with universities and research institutes has been appreciated from local authorities and innovative start-ups. Except cooperation with local authorities where a score of 2 out of 6 has been attributed, the innovative start-ups very well appreciate the cooperation with other entities from the local ecosystem.

The evaluation of the results valorization has been performed by open science procedure, technology transfer, spin-off and support dissemination pathways. The entities from the local Knowledge ecosystem of Iasi, Romania, disseminate results mainly by support and open science practices. Academies, universities and research institutes pay a significant attention through the technology transfer process.



**Figure 18. The evaluation of the research and innovation results throughout the results valorization**

An important evaluation result has been related to the digital technologies integrated in the research and innovation activities and projects. **Figure 18** emphasizes a very good level of digital resources used by the universities, research institutes, local authorities and service organizations in Iași region. The key actors use digital resources for production activities, data acquisition and organization up to transmission and results sharing as well as for data collection and innovation activities. Universities use digital resources for all stages of activities while local authorities from Iași do not use digital resources for data production but mainly for data collection, organization and transmission, as we can notice from **Figure 19**:

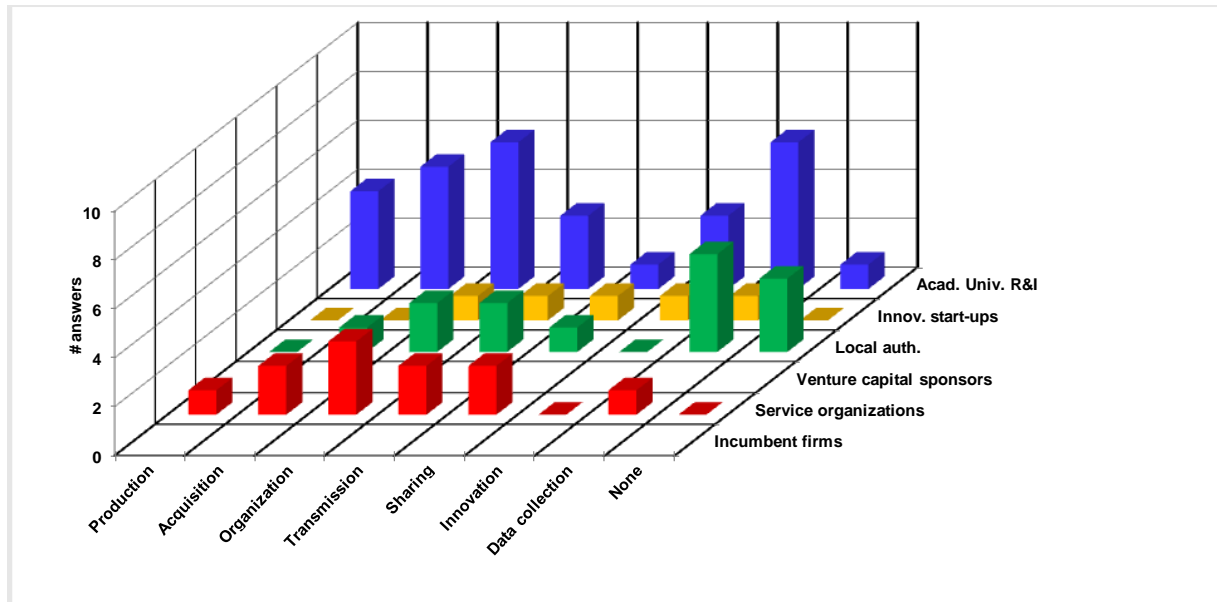


Figure 19. The activities performed by stakeholders entities where are involving the digital resources

## UNIVERSITY OF TURKU

The University of Turku is involved in numerous different local Knowledge ecosystems. Key actors can be divided under five different categories: research and research infrastructure entities, public partners, business and industry partners, funders and civil society organizations.

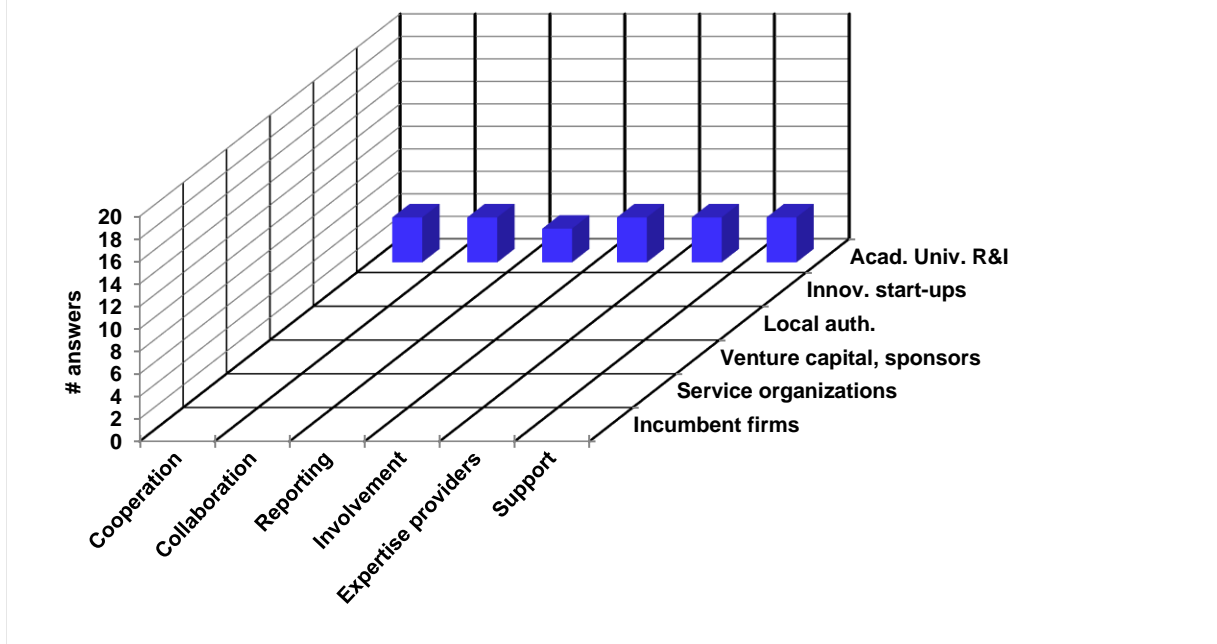
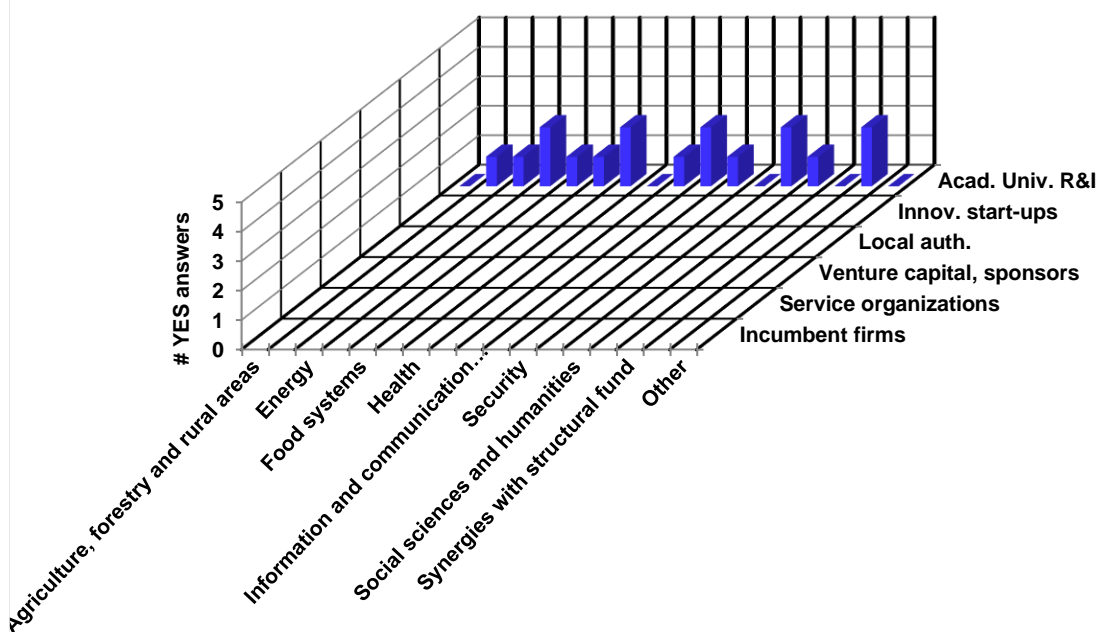


Figure 20. Type of relationships among entities involved in research and innovations activities/projects

Concerning different forms of relationships, as illustrated in **Figure 20**, for example, interaction and cooperation with business stakeholders aim to promote knowledge transfer for mutual benefit in the form of visiting lecturers and keynote speakers, training for business partners, co-created funding applications, recruitment of professors of practice.

The main areas of interest involved in the research and innovation projects are exemplified in **Figure 21**:



**Figure 21. The main research and innovation activities/projects carried out by your entity**

The Knowledge ecosystems consist of local, national and international actors. Cooperation with local stakeholders has the distinct advantage of a shared interest to advance the flourishing of the area. Civic engagement relating to research and innovation is generally considered challenging and the university is currently developing new ways to support this. In this sense, **Figure 22** presents the cooperation among different categories of stakeholder in the local/regional Knowledge ecosystem in Turku area.

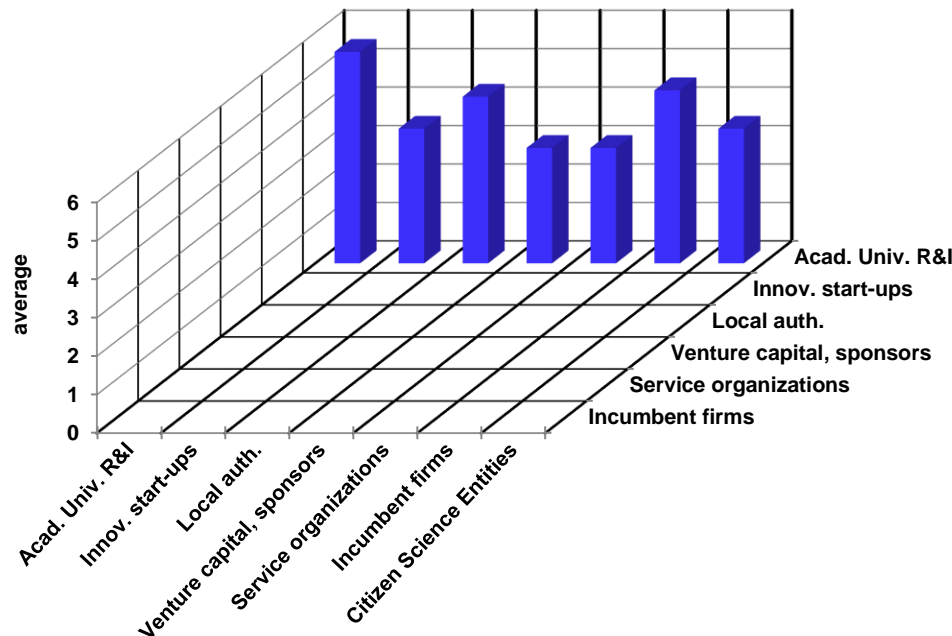
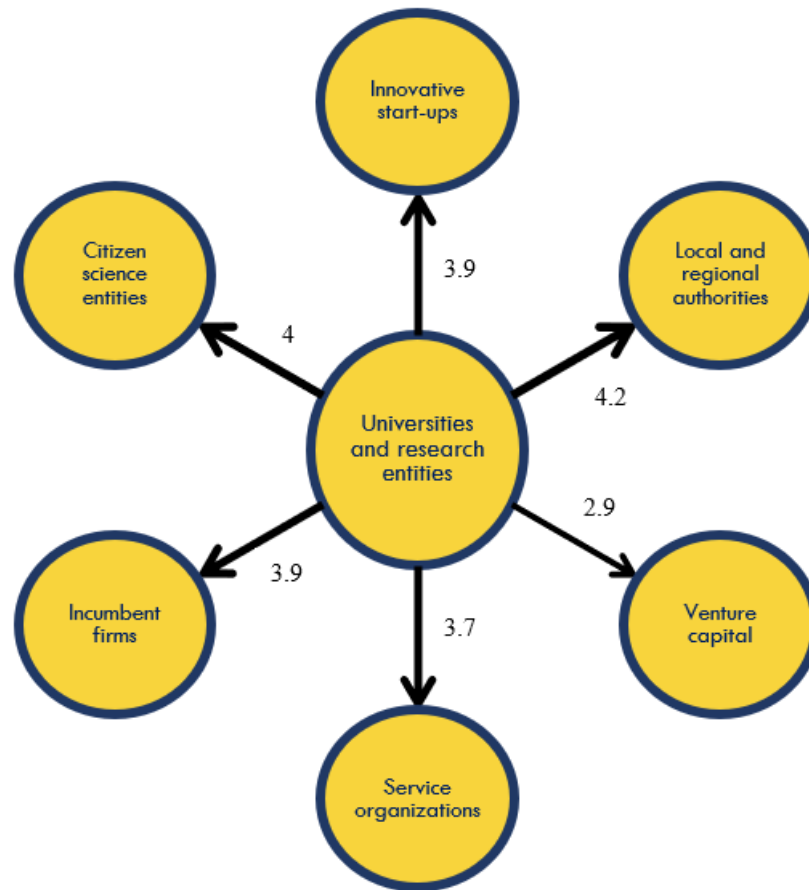


Figure 22. The quality of cooperation with other entities in the research and innovation activities

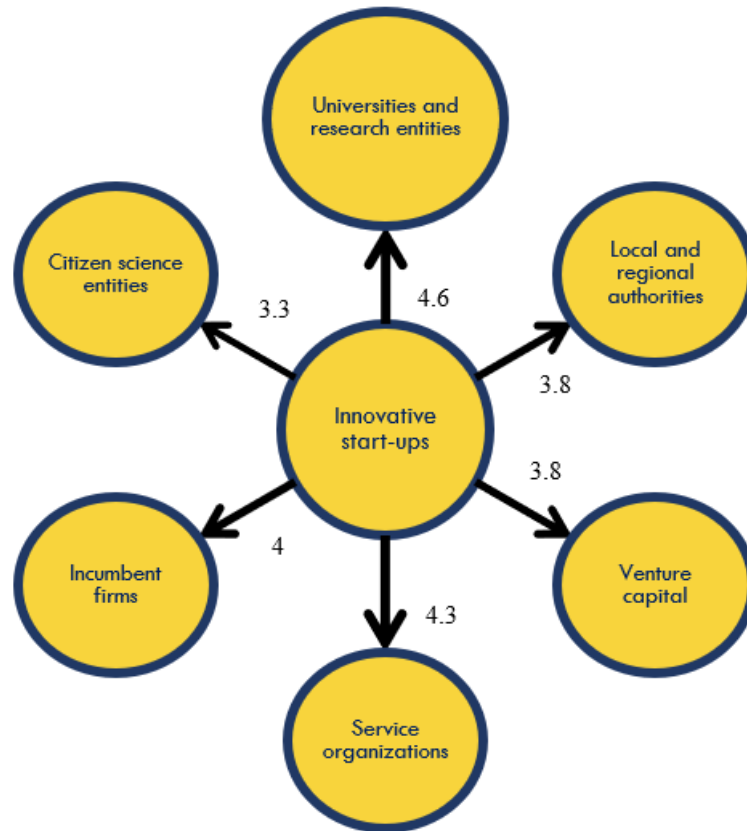
## 8. A SOCIOMETRIC ANALYSIS OF THE LOCAL/REGIONAL KNOWLEDGE ECOSYSTEM

In order to explain the relationships that exist between the different actors in the local Knowledge ecosystem, we conducted a sociometric analysis within the Alliance Knowledge ecosystems using the conceptual model developed so far. For this purpose, we used a scale from 1 (very poor) to 6 (excellent), where stakeholders participating in the research were asked to rate their relationships and interactions with other actors in the local/regional Knowledge ecosystem.



**Figure 23. Evaluation of the relations of universities and research entities in KE**

Alliance universities and research entities (**Figure 23**) rated the relationships with other stakeholders of the same type at 5.3, and with innovative start-ups at 3.9, local and regional authorities at 4.2, venture capital at 2.9, service organisations at 3.7, incumbent firms at 3.9 and citizen science entities at 4.



**Figure 24. Evaluation of the relations of innovative start-ups in KE**

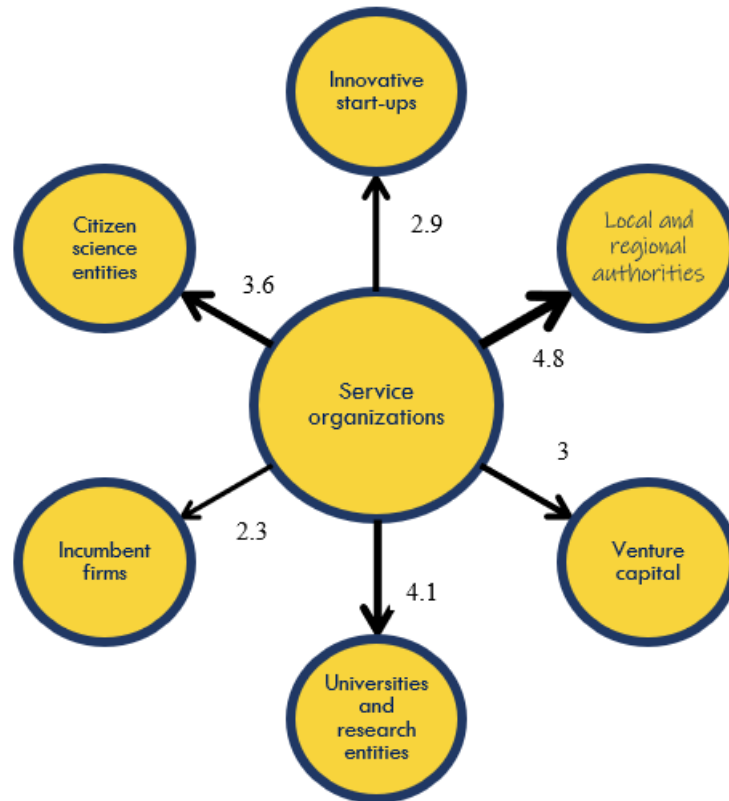
Alliance innovative start-ups (**Figure 24**) assessed the relationships with other stakeholders of the same type at 4.8, and with universities and research entities at 4.6, local and regional authorities at 3.8, venture capital at 3.8, service organisations at 4.3, incumbent firms at 4 and citizen science entities at 3.3.





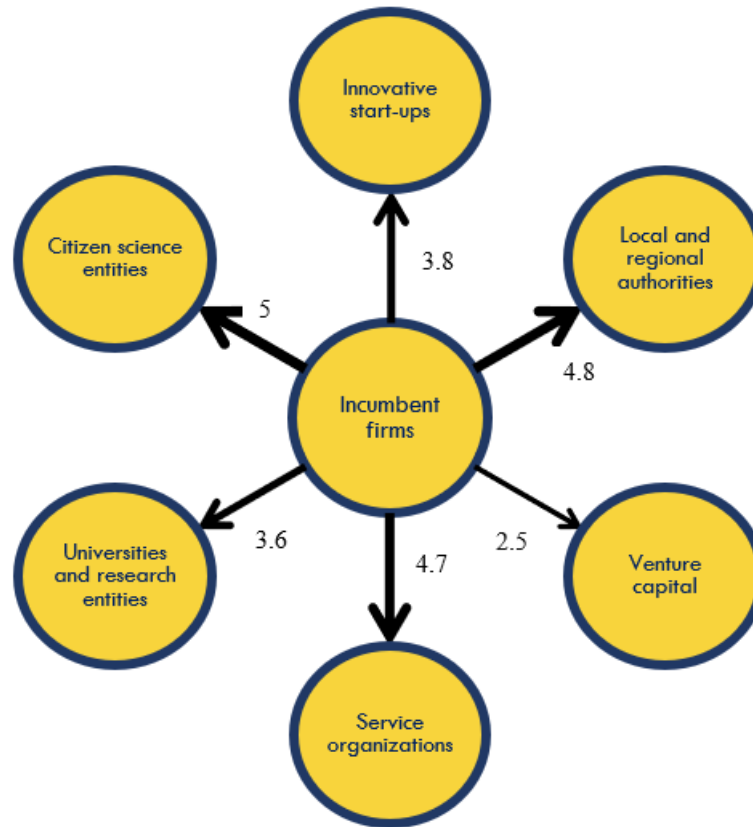
**Figure 25. Evaluation of the relations of local and regional authorities in KE**

Alliance local and regional authorities (**Figure 25**) rated the relationships with other stakeholders of the same type at 5.3, and with innovative start-ups at 3.5, universities and research entities at 5, venture capital at 3.5, service organisations at 4, incumbent firms at 3.8 and citizen science entities at 3.



**Figure 26. Evaluation of the relations of service organizations in KE**

Alliance service organizations (**Figure 26**) evaluated the relationships with other stakeholders of the same type at 3, and with innovative start-ups at 2.9, local and regional authorities at 4.8, venture capital at 3, universities and research entities at 4.1, incumbent firms at 2.3 and citizen science entities at 3.6.



**Figure 27. Evaluation of the relations of incumbent firms in KE**

Alliance incumbent firms (**Figure 27**) assessed the relationships with other stakeholders of the same type at 5.5, and with innovative start-ups at 3.8, local and regional authorities at 4.8, venture capital at 2.5, service organisations at 4.7, universities and research entities at 3.6 and citizen science entities at 5.

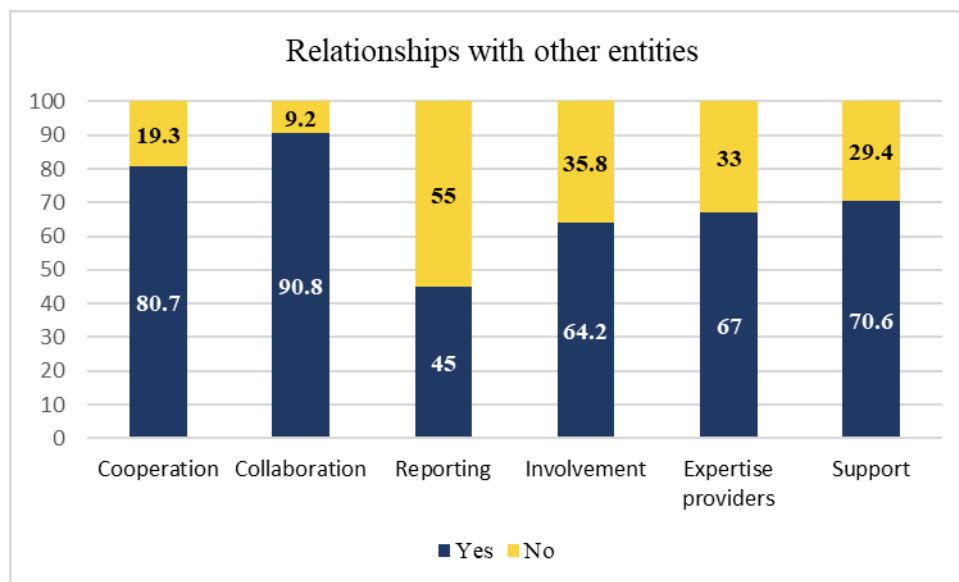


**Figure 28. Evaluation of the relations of citizen science entities in KE**

Alliance citizen science entities (**Figure 28**) rated the relationships with other stakeholders of the same type at 3.5, and with innovative start-ups at 2.5, local and regional authorities at 2, venture capital at 2.5, service organisations at 3.5, incumbent firms at 3 and universities and research entities at 2.5.

For venture capital and sponsors we could not map existing relationships in the Knowledge ecosystem due to lack of valid data from this type of stakeholders.

Thus, after mapping the existing relationships in the Knowledge ecosystem for each of the stakeholders (except service organizations), the relationships with the same type of stakeholders in the ecosystem are rated as the highest quality.



**Figure 29. Typology of existing relationships in KE**

Regarding the type of relationships in the Alliance Knowledge ecosystems (**Figure 29**), the predominant relationship among different categories of stakeholders is collaboration (90.8%), followed by cooperation (80.7%), support (70.6%), expertise providers (67%), involvement (45%), and reporting (45%).

## 9. Policy recommendations

In this section, recommendations about the seven Local Knowledge ecosystems will be detailed, in relation to the policy topics identified below.

The mapping of Knowledge ecosystem can never be comprehensive or fully accurate, due to the dynamic character of the regional environments/of the systems which are always in a process of transformation and enrichment. Through this approach we intend to deepen our understanding of the local/regional Knowledge ecosystem and the practicalities to be achieved within them.

### Policy topic 1: RELATIONSHIPS WITH LOCAL STAKEHOLDERS

Research and Innovation are important concerns for all involved local ecosystems. The local stakeholders are genuinely organized stressing the importance of the universities at the centre of their R&I strategies. The role of Education has been redefined as an innovation and entrepreneurship engine for all the local stakeholders; however, it was necessary to clarify and redefine the responsibilities of everyone involved.

Identification of R&I needs: The universities should understand the needs of private companies and take it into consideration during the planning of the topics of research activities and projects. These R&I actions must be performed in partnership with the local authorities, employers' associations, Chambers of Commerce, to reach the adequate societal relevance of the outputs.

It is necessary to understand the needs of the market and the socio-economic stakeholders to create the product or service and involve the partners which can support the researchers/companies in every step from the identification of the idea until the release of the product to the market.

The Universities Joint Labs (research laboratories in synergy with private companies) work very well in most of the involved local ecosystems. These entities identify perfectly the requirement of the market in a specific field. It helps the technological transfer offices to create new products and services which can be commercialized. It also helps to detect interesting innovative projects and create start-ups.

Universities are considered important hubs and platforms for the development of innovative educational activities which address the companies' demands due to the complexity of their services. The Universities and Research Institutes from all local ecosystems will accompany the projects through all their stages: intellectual property protection, incubation, transfer, development and commercialization, and fundraising.

The relationships between the various stakeholders may be established informally through occasional collaboration or, on the other hand, they may be formally defined through collaboration protocols, contracts, service provision, mentoring, and training, among others.

The evaluation of the local ecosystems revealed also high potential of collaboration between Innovative start-ups and Service Organizations. The positive feedback from Universities and Research Entities proves the win-win collaboration of those two stakeholders.

The analysis performed for all the ecosystems noticed again cooperation on Research and Innovation between local stakeholders through coordination from universities and research entities. The relationships between Service organizations and Incumbent firms are strongly marked by a perfect synergy with local authorities and to a similar extent with Universities and Research Entities with a special emphasis on the genuine synergy between both stakeholders.

Citizen science entities would need an increased representation in relation to other stakeholders. A good initiative of joint activities has been noticed between service organizations and citizen science entities.

This type of relationship is focused on cooperation and collaboration between different stakeholders and this is a characteristic behaviour for all local KEs. The support, expertise providers, and involvement are also typologies of connections between the stakeholders.

There is still a shortage in the citizen implication in the societal policy and this should urgently be addressed by increasing the involvement of specific instruments and actions identified with the support of joint projects.

In the Annex 2 there are presented some examples from the stakeholders' point of view that took part in the focus-groups on how these actors shape the relationships between them in order to build a strong local/regional Knowledge ecosystem.

## Policy topic 2: COOPERATION INSTRUMENTS

Universities are major contributors to local innovation ecosystems and economic growth through their activities of education, research, and innovation. Although universities are open to new types of collaboration and cooperation with different local/regional stakeholders, they face difficulties in developing relationships among different actors. While there are collaboration in the local/regional networks, the level of connections among stakeholders varies depending on the topic and the research approach. Many stakeholders claim that there are no defined instruments to initiate cooperation.

In theory, stakeholders are open to cooperation but face number of challenges. The first one is a lack of the employees who can be responsible for cooperation tasks precisely the communication plan, the concept development of the projects or any activities which can be realised together with other stakeholders. The second obstacle that logically follows from the first one is the stable networking, some stakeholders are very active in building strong relations, but others are not. It is essential to structure the networks, mobilize the territorial strategy, as well as meet regularly with the key actors. Also, it is necessary to set up a clear, visible and coherent strategy with other research entities' strategy.

In order to perform and enhance the process of communication between different categories of stakeholders we propose some steps to follow for an interconnected knowledge space:

- Using a shared information platform;
- Written bilateral agreements;
- Apply to regional, national and European funds;
- Strengthen networking with stakeholders;
- Organizing meetings with the stakeholders on local priorities, as for example: health, digital transition, ecological transition, innovative materials/future transport and education & technology.

This will facilitate collaboration and exchange of best practices, also based on the presence of incentives (generally funding or structures that support R&I collaboration) to maximise the value of knowledge production, circulation, and use. Each stakeholder benefits from the establishment of partnerships/collaborations because these relations contribute to the discussion and development of new solutions to respond to social challenges. There is a fundamental need for strategic plans of local agents in order to mitigate the challenges emerging in the region.

Maintaining these relations is essential, as only through them it becomes possible to think beyond science and research, understanding the needs of society that would otherwise not be possible to identify.

In the Annex 3 there are presented some examples from the stakeholders' point of view who participated in focus-groups concerning cooperation instruments that capture the specifics of each local/regional ecosystem.

### **Policy topic 3: GOOD PRACTICES AND LESSONS LEARNED**

It is essential to bring science outside the University and make scientific language more understandable for all categories of stakeholder. At the same time, it is necessary that citizens challenge researchers, entrepreneurs, business owners and policy-makers to reinvent the way they communicate their ideas and projects.

There are many actors in the R&I ecosystems in the Alliance but until recently they were not well interconnected, and a lack of communication was generating duplicated functions which created redundancy. Thus, the necessity of a better communication. Also, organising meetings with key actors at different levels: in some ecosystems there are special committees which gather different entities of the local Knowledge ecosystem, while in other ecosystems this represent a real need. In strong ecosystems, as a good practice, these special committees has as main role to detect innovative technologies. The first committee provides opinions about the market needs, and the perspectives of the detected technology. The second one is responsible for the patents. The third one is responsible for the start-up's acceleration.

Generally accepted, universities has many different partners and the relations between most of them were not formalised. Nowadays, it is mandatory to formalise every new relationship with a stakeholder through a written bilateral agreement between the actors. Engagement with external stakeholders should become a strategic concern, as one of the highest priority for universities.

In the Knowledge ecosystems, local authorities, public entities and socio-economic stakeholders can join forces by creating a network/a consortium on a specific theme. In most ecosystems the funds come from regional or national level. Once the theme is identified, the consortium can apply for specific calls to create a network. The consortium has some amount of time to organise and to build the network. After that, if the network is successful, they can start the consolidation phase and apply for funds for specific projects.

Another important issue is to have the vision and to get the opinion of the socio-economic partners about the market needs before the development of the product concept. Market research can be a good example of Citizen Science.



“Knowledge for all” should be the University scientific language for civil society, citizen and end-users. At the same time, citizens should challenge researchers to reinvent the way they communicate their ideas and projects, making them better communicators. The symbiotic effect of these collaborations is thus revealed, as everyone who participates in them benefits in some way, whether with greater scientific knowledge or with an easier way to communicate with the public. In this sense, we list some relevant examples of good practice in cooperation between stakeholders, promoted by universities in the Alliance: “European Researchers' Night”; “Science Celebration Day(s)”, “Corporate Corner”; “Kindergarten of Managers”; other activities such as festivals, forums, film forums, scientific breakfasts, international conferences, exhibitions. During all these initiatives, citizens have the opportunity to explore several scientific themes, through simple and fun activities. These are projects that mirror good cooperation practices between stakeholders, bringing citizens closer to science and innovation, promoting scientific literacy.

All these initiative do not have to limit only to universities and one or two other categories of stakeholders that usually are involved in common actions in the Knowledge ecosystem, but to comprise all the potential beneficiaries at the local/regional level.

In the Annex 4 there are presented some excerpt from the focus-groups organised in the Alliance showing the stakeholders' point of view concerning good practices within the local/regional Knowledge ecosystem.

#### **Policy topic 4: MEASUREMENT INSTRUMENTS OF CIVIC ENGAGEMENT IN R&I ACTIVITIES**

The interest and perceived need to engage citizens, civil society actors and end-users in general to R&I activities is increasing, although the degree of involvement differ from one ecosystem to another.

First, it is recommended to raise awareness among researchers about Citizen Science and add value to the citizens' engagement that they can bring to research projects from ideas to results phases. Innovation must serve society and be coherent with human values and current needs.

The citizens and society (including students and researchers) should be at the centre of the innovation therefore, they should be involved in the process of R&I.

Regarding citizens' engagement in R&I activities: it should always be considered that the active participation of citizens in these activities should be voluntary and that it can be encouraged but not coerced. Secondly, this participation requires some form of action on the part of citizens, i.e., they cannot simply be passive recipients of knowledge and/or innovation. Finally, these activities should be, as far as possible, strongly linked to the social mission, trying to find new solutions (products, services, models, etc.) that simultaneously meet society's demands and lead to the best use of existing goods and resources. Citizen integration throughout the scientific and innovation process ensures that the concerns and interests of civil society are consistently understood and considered, and society also has an active and informed role in public decision-making.

In the Annex 5 there are presented some excerpt from the focus-groups organised in the Alliance showing the stakeholders' opinions regarding the degree of citizen involvement within the local/regional Knowledge ecosystem.

Based on the framework of the local Knowledge ecosystem developed by each EC2U partner by identifying actors and capacities involved in promoting and implementing R&I activities, we designed a new instrument(s) to measure civic engagement in a research project. Citizen engagement in scientific activities is getting more important as the valorization of research activities for the benefit of communities has a societal impact, and the democratization of science enhances the public's influence over science. In this context of increasing civic engagement, the evaluative efforts/ instruments remain still limited, especially the qualitative ones. Without adequate evaluation instruments, it is difficult to ensure engagement principles and practices, assess the outcomes of engagement, learn from current practices and demonstrate the benefits of civic engagement in R&I area.

In order to evaluate public engagement in research and innovation activities, we proposed a toolkit of measuring instruments of civic engagement, comprising four evaluation tools as follows:

- **Instrument no 1:** Measure or assess the current stage of civic engagement (Developed by RI4C2 team).
- **Instrument no 2:** Quantitatively assess volunteers' profiles according to their engagement in a project.
- **Instrument no 3:** Qualitatively assess the motivations in civic engagement according to RIC4 expertise and strategy (Newly developed by the RI4C2 team).
- **Instrument no 4:** Quantitative and Qualitative measure based on the Engagement principles from the "Community-engaged research" concept.

Each instrument can be used independently for a certain stage of the project (for example, in the design phase and also for the measurement of the current stage of the civic engagement), or the instruments can be combined.

Knowledge ecosystem is meant to boost exchanges of knowledge, to join forces to build strong bridges across institutional and disciplinary boundaries, look for new collaborative formats and spaces in order to address shared challenges, and shape their own changing roles in the process. A sustainable long-term Knowledge ecosystem is kept alive through continuous dialogue and cooperation between policy-makers and research area, and among all categories of stakeholders. Universities, as promotor of research and innovation, must coagulate around other categories of stakeholder in order to design a common vision and agenda for the modern society. Thus, creating new levers for the development of strong partnerships. There is a stringent demand for a closely connection and collaboration among all the categories of stakeholders in the local/regional Knowledge ecosystem in order to create synergies that will impact the future societies.

## 10. References

- Ahrne, G., Brunsson, N. 2011. *Organization outside organizations: the significance of partial organization*. *Organization*, 18, 83–104. DOI: 10.1177/1350508410376256.
- Aksenova, G., Kiviniemi, A., Kocaturk, T., & Lejeune, A. 2018. *From Finnish AEC Knowledge ecosystem to business ecosystem: lessons learned from the national deployment of BIM*. *Construction Management and Economics*, 1-19. DOI: 10.1080/01446193.2018.1481985.
- Archer-Brown, C. and Kietzmann, J. 2018. *Strategic knowledge management and enterprise social media*. *Journal of Knowledge Management*, Vol. 22 No. 6, pp. 1288-1309. <https://doi.org/10.1108/JKM-08-2017-0359>
- Bahrami H., Evans S. 2014. *Super-Flexibility for Knowledge Enterprises: A Toolkit for Dynamic Adaptation*. Second edition. Springer: Berlin, Heidelberg.
- Barry, D., Rerup, C. 2006. *Going Mobile: Aesthetic Design Considerations from Calder and the Constructivists*. *Organ. Sci.* 17, 262-276. DOI: 10.1287/orsc.1050.0165.
- Bray, David A. 2007. *Knowledge ecosystems: A Theoretical Lens for Organizations Confronting Hyperturbulent Environments*. *Organizational Dynamics of Technology-based Innovation: Diversifying the Research Agenda*, T. McMaster, D. Wastell, E. Ferneley, and J. DeGross, eds. Springer, June 2007.
- Bray, D. 2008. *Knowledge ecosystems: Technology, Motivations, Processes, and Performance*. Dissertation, Emory University.
- British Academy and Royal Society. 2017. *Data management and use: Governance in the 21st century: A joint report by the British Academy and the Royal Society*.
- Clarysse, B., Wright, M., Bruneel, J., Mahajan, A. 2014. *Creating value in ecosystems: Crossing the chasm between knowledge and business ecosystems*. *Research Policy*, 43(7), 2014, 1164-1176. DOI: 10.1016/j.respol.2014.04.014.
- Council of the European Union. 2021. *Conclusions on Future governance of the European Research Area (ERA)*, adopted on 26/11/2021, 14308/21.
- Davis, J.P. 2016. *The group dynamics of interorganizational relationships: collaborating with multiple partners in innovation ecosystems*. *Admin. Sci. Q.* 61(4), 621-661. DOI: 10.1177/0001839216649350.
- Davis, J.P., Eisenhardt, K.M. 2011. *Rotating leadership and collaborative innovation: recombination processes in symbiotic relationships*. *Admin. Sci. Q.* 56(2), 159-201. DOI: 10.1177/0001839211428131.
- Delli, Michael. 2016. *Civic Engagement*. APA.Org. American Psychological Association, n.d. Web. 25 Apr. 2016.
- Deparis, É., Abel, M. H., Lortal, G., Mattioli, J. 2014. *Information management from social and documentary sources in organizations*. *Computers in Human Behavior*, 30, pp. 753-759. DOI: 10.1016/j.chb.2013.10.033.

- Dougherty, D., Dunne, D.D. 2011. *Organizing ecologies of complex innovation*. Organ. Sci. 22, 1214-1233. DOI: 10.1287/orsc.1100.0605.
- European Commission, Directorate-General for Research and Innovation. 2022a. *Knowledge ecosystem: defining a European competence framework for R&I talents*, Publications Office of the European Union, <https://data.europa.eu/doi/10.2777/1117>
- European Commission, Directorate-General for Research and Innovation. 2022b. Berger, F., Nieth, L., Stalla, M., et al., *Knowledge ecosystems in the New ERA: a monitoring methodology on institutional change in the area of R&I at universities in Europe*, Publications Office of the European Union, <https://data.europa.eu/doi/10.2777/95651>
- European Commission: Manzoni, M., Vohland, K., Schade, S. 2021a. *Exploring Citizen Science Strategies and Initiatives in Europe*. Vohland, Katrin, Anne Land-Zandstra, Luigi Ceccaroni, Rob Lemmens, Josep Perelló, Marisa Ponti, Roeland Samson, and Katherin Wagenknecht. The science of Citizen Science. Springer Nature.
- European Commission, Directorate-General for Research and Innovation. 2021b. *European Research Area Policy Agenda – Overview of actions for the period 2022-2024*, Publications Office of the European Union: Luxembourg.
- European Commission, Directorate-General for Research and Innovation. 2021c. *EU Research and Innovation for and with CITIES*, Publications Office, <https://data.europa.eu/doi/10.2777/289101>
- European Commission. 2021d. Romanai, J., Mahieu, B., Zego, K. *Briefing Note for Stakeholder Consultation*, WP1-3, Knowledge ecosystems and their Actors across the ERA.
- European Commission. 2020. *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. A New ERA for Research and Innovation (30.09.2020)*
- European University Association. 2019. Sybille Reichert, *The Role of Universities in Regional Innovation Ecosystems*, European University Association asbl.
- Franzoni, C., Sauermann, H. 2014. *Crowd science: the organization of scientific research in open collaborative projects*. Research Policy, 43(1), 1-20. DOI: 10.1016/j.respol.2013.07.005.
- Freeman, E. 1984. *Strategic Management: A Stakeholder Approach*, Cambridge University Press.
- Friends of Smart Specialisation (FoSS ). 2021. *Knowledge ecosystem in the New Era (WP1-3: Knowledge ecosystems and their Actors across the ERA)*, <https://friendsofsmartspecialisation.eu>
- Gulati, R., Puranam, P., Tushman, M. 2012. *Meta-organization design: rethinking design in interorganizational and community contexts*, Strateg. Manage. J. 33(6), 571-586. DOI: 10.1002/smj.1975.
- Gura, Trisha. 2013. *Citizen Science. Amateur experts*. Nature. 496 (7444): 259-261.
- Hecker, S., Wicke, N., Haklay, M., & Bonn, A. 2019. *How does policy conceptualise Citizen Science? A qualitative content analysis of international policy documents*. Citizen Science: Theory and Practice, 4, 1. <https://doi.org/10.5334/cstp.230>.

- Isenberg, D. 2011. *The entrepreneurship ecosystem strategy as a new paradigm for economic policy: Principles for cultivating entrepreneurship*, invited presentation at the Institute of International and European Affairs, Dublin, Ireland, May 12.
- Järvi, K., Almpantopoulou, A., & Ritala, P. 2018. *Organization of Knowledge ecosystems: Prefigurative and partial forms*. *Research Policy*, 47(8), 1523-1537. DOI: 10.1016/j.respol.2018.05.007.
- Jucevičius, G. 2022. *Knowledge ecosystem Approach to Addressing the Wicked Problems*. In *European Conference on Knowledge Management*, 23(1), 576-582. DOI: 10.34190/eckm.23.1.810.
- Kelly, E. 2015. *Business Ecosystems Come of Age; Business Trends; Industry Report*; Deloitte University Press: London, UK, 1-17.
- Maglyas, A., Smolander, K. 2014. *Eight Types of Relationships between Stakeholders in ERP Development Networks: A Case Study of Three Large Enterprises*. In: Comisso, T.H., Nørbjerg, J., Pries-Heje, J. (eds) *Nordic Contributions in IS Research*. SCIS 2014. Lecture Notes in Business Information Processing, vol 186. Springer, Cham. [https://doi.org/10.1007/978-3-319-09546-2\\_5](https://doi.org/10.1007/978-3-319-09546-2_5)
- Manzoni, M., Vohland, K., Schade, S., *Exploring Citizen Science Strategies and Initiatives in Europe*, European Commission, 2021.
- Moore, J. F. 1993. *Predators and prey: a new ecology of competition*. *Harvard Business Review*, 71, 75–83.
- Oliver, Z. T., Hogan, M., Albats, E. 2020. *Bridging the Knowledge and Business Ecosystems: Resources and Mechanisms for Regional Entrepreneurial Development*, *Triple Helix*, 7, pp. 83-121. DOI: 10.1163/21971927-bja10008.
- Peltoniemi, M., Vuori, E. 2004. *Business ecosystem as the new approach to complex adaptive business environments*. In: *Proceedings of eBusiness research forum*, Citeseer, 267–281.
- Perkmann, M., Schildt, H. 2015. *Open data partnerships between firms and universities: the role of boundary organizations*, *Res. Policy*, 44, 1133-1143. DOI: 10.1016/j.respol.2014.12.006.
- Reischauer, G., Güttel, W. H., Schüssler, E. 2021. *Aligning the design of intermediary organisations with the ecosystem*. *Industry and Innovation*. DOI: 10.1080/13662716.2021.1879737.
- Ruppert, E., Isin, E., & Bigo, D. 2017. *Data politics*. *Big Data & Society*, 1-7. <https://10.1177/2053951717717749>.
- Scarlat, E., Maracine, V., Maries, I. 2011. *Modelling the dynamics of knowledge flow within networked communities of professionals*. *Technology and Knowledge Flow*, 27–50. DOI: 10.1016/B978-1-84334-646-3.50002-2.
- Thomas, L.D.W.; Autio, E. *Innovation Ecosystems in Management: An Organizing Typology*. In *Oxford Research Encyclopedia of Business and Management*; Oxford University Press: Oxford, UK, 2020.
- Valkokari, K. 2015. *Business, innovation, and Knowledge ecosystems: how they differ and how to survive and thrive within them*. *Technol. Innov. Manage. Rev.*, 5 (8), 17-24. DOI: 10.22215/timreview/919.

- Van der Borgh, M., Cloudt, M., Romme, G. 2012. *Value creation by knowledge-based ecosystems: evidence from a field study*. R&D Management, 42 (2), pp. 150-169. DOI: 10.1111/j.1467-9310.2011.00673.x.
- Vohland, K., Land-Zandstra, A., Ceccaroni, L., Lemmens, R., Perelló, J., Ponti, M., Samson, R. and Wagenknecht, K. 2021. *The science of citizen science*, Springer Nature.
- Yang, J. S., Chae, S., Kwak, W., Kim, S. B., Kim, I. 2009. *Agent-Based Approach for Revitalization Strategy of Knowledge ecosystem*. Journal of the Physical Society of Japan, 78(3), 034803-1-034803-8. DOI: 10.1143/JPSJ.78.034803.



## 11. Annexes

### ANNEX 1. KNOWLEDGE ECOSYSTEM GLOSSARY

<b>Knowledge ecosystem</b>	Knowledge ecosystem represents a complex structure/system/framework which address in a holistic approach greatest challenging, pressing and exciting issues our society faces nowadays, involving different actors engaged in the development of an active society, having as main outcomes complex knowledge value-chain, innovation and well-being of citizen and communities.
<b>Stakeholders</b>	Stakeholders are different actors (as contributor and benefit members) in a local/regional dynamic R&I ecosystem, who create new knowledge and provide innovation meant to solve the challenges of nowadays communities from an interdisciplinary/multidisciplinary approach.
<b>Citizen science</b>	Citizen science represents scientific production undertaken by citizen in the Knowledge ecosystem through collaboration between different actors at the local/regional level.
<b>Civic engagement</b>	Civic engagement, as a process that addresses the societal issues, supposes involvement of people and communities in the knowledge production and research together with local/regional actors.
<b>Best practices</b>	Best practices represent effective procedures/guidelines to foster dynamic interactions between entities to improve knowledge circulation and boost collaborations in a constantly changing environment.
<b>Lessons learned</b>	Lessons learned are new acquired knowledge (new ideas, new understanding/perspectives) from the collaboration between different categories of stakeholder.
<b>Policy makers</b>	Policy makers are represented by individuals/persons who belong to networks and communities involved in creation of instruments, policies and practices in order to achieve innovation in the local/regional Knowledge ecosystem.
	<b>Universities and Research Institutes</b> – the agora for knowledge creation and diffusion; facilitate co-operation with surrounding R&I ecosystem actors and play a key role in engaging citizens in science.
	<b>Innovative start-ups</b> – as powerful “engines” of innovation, are companies working to solve complex problems, bringing continuous creativity and healthy competition into the local and regional ecosystem.



RI4C2  
Research & Innovation  
For Cities & Citizens



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101035803

<i>Stakeholders categories</i>	<b>Local authorities</b> – as public institutions closest to citizens, they are creators of policy-making and best practices, and represent catalysts for change.
	<b>Venture capital, sponsors</b> – as investors who provide capital to start-up ventures, support small companies that wish to expand.
	<b>Service organizations</b> – non-profit organizations independent of government and task-oriented; community-based groups that share the same name, goals, membership requirements, and meeting structure.
	<b>Incumbent firms</b> – firms which are already in position in a market; leaders in industry.
	<b>Citizen science entities</b> – innovators, citizen-scientists, different NGOs, different associations, that have people at “the heart” of the Knowledge ecosystem.





## ANNEX 2. RELATIONSHIPS FRAMEWORK AMONG STAKEHOLDERS IN THE 7 LOCAL/REGIONAL KNOWLEDGE ECOSYSTEMS

For a strong ecosystem, it is important for this system to be based upon open and inclusive collaboration in order to connect all categories of stakeholders for providing answers to current societal challenges.

Based on the responses to the questionnaires and on the focus-group/workshops/debates/discussions/interviews/meetings organized in the seven University communities, the relationships among different categories of stakeholders in the local/regional KE differ in accordance with their own experiences and involvement in varied types of R&I projects (from a moderate level to a high level of awareness/implication). Overall, most of the stakeholders characterize their relations with other entities in the local/regional Knowledge ecosystem as cooperation and collaboration, in terms of: “excellent”, “very good”, “good”, “fine”, “pretty poor”.

We provide below examples from the Alliance’s partners:

NR. CRT.	UNIVERSITY	STAKEHOLDERS’ RESPONSES/ANSWERS/OPINIONS
1.	UNIVERSITY OF POITIERS	<p>“Works very close with the local stakeholders, commonly engaging them to participate in the local events.” (Focus-group participant)</p> <p>“We share experience and discuss our projects and it helps to create something together, moreover some of these entities have the same sphere of interest and goals like us.” (Focus-group participant)</p> <p>“I really work more with researchers to disseminate science and sometimes I look for ways to work with companies, for example in sport. The CRITT is a resource center and our partners CHU, CNRS, Inserm, Technopole, Pepite, different laboratories in the University of Poitiers because we conduct common research projects together, workshops and formations with Pop and ADI, CNRS, Technopole etc.” (Focus-group participant)</p>
2.	UNIVERSITY OF SALAMANCA	<p>“I cooperate with different agents, not only from private companies, but also with public institutions.” (Focus-group participant)</p> <p>“The collaboration with the University is presented as an absolutely extraordinary agent to promote projects like the one I represent.” (Focus-group participant)</p>



		<p>"We maintain a very fluid relationship with various organizations, for example, with the Salamanca City Council and we are part of the City Council Gender Violence Commission that are part of it." (Focus-group participant)</p> <p>"We are a foundation that depends on the town hall, therefore, contact with the citizens is fundamental (...) we care about our territory." (Focus-group participant)</p>
3.	UNIVERSITY OF COIMBRA	<p>"Several relationships among them (and also with other local agents that were not present) and that it can be established at different levels and typologies, namely, signing cooperation protocols, contracts, service provision, financing, mentoring, training, among others. The stakeholders characterize the relations that are established in the Knowledge ecosystem as being symbiotic relationships." (Focus-group participant)</p> <p>"Examples: The Garden goes to School project in which Coimbra City Council (CMC) and the Botanical Garden cooperate, the strategy established between the Centro de Ciência Viva – o Exploratório and the Intermunicipal Community of the Coimbra region (CIM) to combat school failure." (Focus-group participant)</p>
4.	"FRIEDRICH-SCHILLER" UNIVERSITY OF JENA	<p>"In Jena, as in many city-universities, the university plays a central role in the Knowledge ecosystem. Not only as a whole, but also the smaller units, the research groups and service units, are actively reaching out and connecting and trying to collaborate with each other and the local stakeholders." (Focus-group participant)</p> <p>"Some people and units serve as "hubs" that connect different actors in the Jena Ecosystem: for example, the Technology Transfer Office or the JenaVersum network. They know many actors in the ecosystem, connect people and organize networking events and other formats for exchange and collaboration." (Focus-group participant)</p>
5.	"ALEXANDRU IOAN CUZA" UNIVERSITY OF IAȘI	<p>"And the ecosystem, Knowledge ecosystems assume a very close relationship between human and technological resources and the messages that can be managed and improved." (Focus-group participant)</p>



		<p>"There is a collaboration between the academic environment and the economic environment, but it is rather..., maybe punctually, yes, rather at the initiative of each of the entities. And not as coming from the system." (Focus-group participant)</p> <p>"Relations between the business environment, between companies, between the entrepreneur and the political environment are very, very isolated." (Focus-group participant)</p>
6.	UNIVERSITY OF TURKU	<p>"We set up collaborations where we share materials or information for common use or common goal." (Focus-group participant)</p> <p>"There are different levels of collaboration with business. So, there is research collaboration. There is providing of services. And then, our researchers work as consultants for companies, and share their knowledge that way." (Focus-group participant)</p> <p>"Mutual benefit is a good concept here. I have talked to some of our research managers, and they say that there are also some partners that would like to receive something from us but not to give that much back. Reciprocity and mutual benefit are valued." (Focus-group participant)</p> <p>Some examples:</p> <p>"In terms of pharmaceutical industry, some to highlight are Roche and Faron. We have a professor of practice from Roche, and we have done a lot of collaboration with them." (Focus-group participant)</p> <p>"We have had their people as speakers in our events, and we are planning to do more of this kind of collaboration." (Focus-group participant)</p> <p>"Orion is another important one. The University of Turku has an agreement with Orion." (Focus-group participant)</p> <p>"Åbo Akademi University has a formal agreement with Bayer." (Focus-group participant)</p>



RI4C2

Research & Innovation  
For Cities & Citizens



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101035803

		<p>“We should mention that Bayer and Orion both have a high presence here. Orion has a research center here in Turku. It’s important, because our PhD students can go to do their PhD work there.” (Focus-group participant)</p> <p>“We do interact with pharmaceutical industry. Either through purchases or research-based collaboration. Certain research groups in BioCity have direct links with Orion and with Faron.” (Focus-group participant)</p>
--	--	--



### ANNEX 3. COOPERATION INSTRUMENTS IN THE SEVEN LOCAL/REGIONAL KNOWLEDGE ECOSYSTEM

The multi-stakeholder approach allows to face today's challenges. In this sense, regions become hubs for systemic innovation. It is essential to structure the networks among stakeholders, mobilize the territorial strategy, as well as meet regularly with the key actors. Also, it is necessary to set up clear, visible and coherent strategy with other research entities' visions, and share them through different channels/instruments: shared information platforms, meetings with the stakeholders at the local/regional levels with priorities especially on smart specialisations, networking events/sessions/spaces.

We provide below examples from the Alliance's partners:

NR. CRT.	UNIVERSITY	STAKEHOLDERS' RESPONSES/ANSWERS/OPINIONS
1.	UNIVERSITY OF POITIERS	<p>"Not especially an instrument... but for example, sending emails, calling and after organizing a meeting or a meeting online if they are far away or not available." (Focus-group participant)</p> <p>"We organize conferences most of the time because universities and the regional authorities ask us, there is a citizens' component because these events are open to the public." (Focus-group participant)</p> <p>"It is a first step to initiate a relationship between individuals, it happens by chance at the meetings, in congresses or during mission where people who come there discuss something and then we can set up a collaboration therefore inter-individual or research input and after that will apply the tutorship and therefore involved a higher administrative level but it always starts with the inter-individual relationships. It gives the best instrument for cooperation." (Focus-group participant)</p> <p>"It is necessary to make a large group for everyone." (Focus-group participant)</p> <p>"It's important to keep these links with the partners to always say what happens around and to show that we are an important actor in the city." (Focus-group participant)</p>



		<p>"It is not enough only to initiate the cooperation but to create a close collaboration so it is necessary to build a stable relation and it can be a challenge in the big organizations with complicated organizational structures like in the University of Poitiers." (Focus-group participant)</p>
2.	UNIVERSITY OF SALAMANCA	<p>"For us it is essential to support and sustain the local business. We launch calls, we listen to proposals, people come to us who want to contribute an idea, a proposal, it is analysed and in the end it can be put into practice or not." (Focus-group participant)</p> <p>"We collaborate with the schools, we elaborate a program of activities, of educational tasks that are complementary to the school curriculum, what the children study in the classroom." (Focus-group participant)</p> <p>"We are also dedicated to the direct management of services, such as music schools, we also have a choir and a young orchestra. And all this with the cooperation of society." (Focus-group participant)</p>
3.	UNIVERSITY OF COIMBRA	<p>"There are no defined instruments to initiate cooperation. All agreed that it is in the identification of needs and in the search for solutions that the points of contact emerge." (Focus-group participant)</p> <p>"The main reason identified to maintain those relations is the fact that every stakeholder benefits from the establishment of partnerships/collaborations because these relations contribute to the discussion and development of new solutions to the social challenges that we all face." (Focus-group participant)</p>
4.	"FRIEDRICH-SCHILLER" UNIVERSITY OF JENA	<p>"It is precisely this collaboration that is in the foreground and, as with natural ecosystems, that it also takes place together in one place. Of course, this is now much easier in the digital world, also know and establish cooperation with remote actors." (Focus-group participant)</p> <p>"The important step is to come from this first kick-off talks in such a binding cooperation. Yes, this is not just a one-off stay, but that we take on something together, that the various working groups are now also included in</p>



		<p>[Network 4], that each working group also has such a mission statement, that one also generates a common commitment.” (Focus-group participant)</p> <p>“No, not so much via email, but actually personal contact, for example via faculty council or political matters. It's easier with the students, because we can also work together with our cooperation partners, i.e. with Uni Sport. For example, people talk about the SGM, BGM (student health management, corporate health management).” (Focus-group participant)</p> <p>“Somehow you have to try to build up the ecosystem and fill it with life, with the concept. And not just, for example, throw a platform or a room there, but the space must also be used somehow, that one somehow institutionalizes this exchange, for example through regular meetings, jour fixe...”(Focus-group participant)</p>
5.	“ALEXANDRU IOAN CUZA” UNIVERSITY OF IAȘI	<p>“With the City hall, with social institutions, those that study the elderly and so on, here you can cooperate very well with the university, even in this field of health, but not in the classic way, I'm not talking about a hospital, but about well-being. How can these people be helped in these institutions, the institutionalized, and at home, counseled, and so on.” (Focus-group participant)</p>
6.	UNIVERSITY OF TURKU	<p>“It's quite simple. You contact them and ask to have a discussion. Or networking events. I think that this has happened with, for example, members of parliament and multiple companies.” (Focus-group participant)</p> <p>“You send an email or pick up the phone.” (Focus-group participant)</p> <p>“We have a donations office, and we hired a specialist to lobby for donations. The person does a lot of lobbying for the university as a whole but a big part of it is biomedical research. The person has wide contacts, meets with representatives of different groups, and discusses possible ways of collaborating.” (Focus-group participant)</p>



#### ANNEX 4. GOOD PRACTICES AND LESSONS LEARNED IN THE SEVEN LOCAL/REGIONAL KNOWLEDGE ECOSYSTEM

A Knowledge ecosystem is meant to boost exchanges of knowledge, to join forces to build strong bridges across institutional and disciplinary boundaries, look for new collaborative formats and spaces in order to address shared challenges, and shape their own changing roles in the process. The performance of the local Knowledge ecosystem consists in a better vision regarding the linking between universities, seen as promoters of value creation and innovation, with their own local/regional stakeholders.

We provide below examples from the Alliance's partners:

NR. CRT.	UNIVERSITY	STAKEHOLDERS' RESPONSES/ANSWERS/OPINIONS
1.	UNIVERSITY OF POITIERS	<p>"Good cooperation practice is 'La Fête de la Science' and there we are really working together with local stakeholders." (Focus-group participant)</p> <p>"It is necessary to show that we are open and do not doubt to initiate the cooperation because many people think that university is a closed structure and researchers with their researchers are super far away and complicated as well, however in reality it's not like that." (Focus-group participant)</p> <p>"The lesson to be learned from this is actually - to be clear and that is the goal of the ecosystem, to better understand and therefore better distribute the training and a little fluidize the ecosystem because it is true that in the ecosystem when the new person arrives with a project, he can be quickly get lost in the end." (Focus-group participant)</p>
2.	UNIVERSITY OF SALAMANCA	<p>"We organize, for example, international conferences. At least we try to do one yearly and many times we do two, which are usually around the dates of March 8, which is International Women's Day, or November 25, the Day against gender violence. And we also use another date, many times, when perhaps we have more activities, which is December 10, Universal Declaration of Human Rights Day. We have highly qualified speakers from the University of Salamanca, and it is also a highly interdisciplinary area where medical professionals, education professionals, psychologists, lawyers, judges, and police officers participate." (Focus-group participant)</p>





RI4C2

Research & Innovation  
For Cities & Citizens



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101035803

		<p>"We carry out a series of cultural activities: an exhibition to celebrate the eighth centenary of the creation of the University of Salamanca. The exhibition was entitled 'Faces of Oblivion', and was a tribute to the women of the University of Salamanca who during these 8 centuries had not received recognition. The Equality Unit of the University, the Commission for the Eighth Centenary of the University Foundation, as well as the Salamanca City Council participated in this exhibition." (Focus-group participant)</p> <p>"We also have other activities such as forums, film forums, scientific breakfasts, inviting staff from the university and private entities. It all depends on the topic we want to discuss, and we always try to involve members of the university and the public." (Focus-group participant)</p> <p>"Our educational training consists of more than three hundred activities, three hundred activities divided into blocks, because they can be about the arts, language, museums, science, the environment, and entrepreneurial culture." (Focus-group participant)</p> <p>"The great benefit is to collaborate, listen and knock on other doors and open the door. For me that is extremely enriching. It is the best way to open your mind, to know what other people are doing, different approaches to an idea because that is the best way to move forward and to continue forward the second place." (Focus-group participant)</p>
3.	UNIVERSITY OF COIMBRA	<p>"The annual celebration of the 'European Researchers' Night' stands out as an example of good practice in cooperation between stakeholders, promoted by the institute of Interdisciplinary Research (IIIUC). This is a project that involves the participation of the University of Coimbra, research and development units, and UECAFs (Culture and Training Support Extension Units), as well as researchers and PhD students. The Coimbra City Council and their infrastructures, schools belonging to the municipalities, and the city citizens are also stakeholders involved in this project." (Focus-group participant)</p>



		<p>“The existence of a true necessity to bring science outside the University and make scientific language (more) accessible to everyone. At the same time, citizens challenge researchers to revive the way they communicate their ideas and projects, making them better communicators.” (Focus-group participant)</p>
4.	“FRIEDRICH-SCHILLER” UNIVERSITY OF JENA	<p>“For us, it's actually the big show-room events ... This is also Born Global Startup Festival, Set-up Jena, formerly Foundation and Innovation Day. All citizens are explicitly invited and then join in the discussion in panel discussions, in keynotes to ask questions and to exchange ideas with the start-up projects, for example at a showcase as part of the Green Innovation Day.” (Focus-group participant)</p> <p>“We are now at the Long Night. This year, for example, we are planning to participate in the Day of Diversity in order to also present diversity, diversity in research, for the urban society. These are the events that always take place at the Holzmarkt. About EC2U, of course, the think tank, which takes place in March, the city public is also invited. The community foundation is also invited, which is then these organized subsets...”(Focus-group participant)</p> <p>“And we are currently working on a label, "Knowledge for all" in the context of our network, in order to make events aimed at urban society, i.e. science communication events, more visible.” (Focus-group participant)</p>
5.	“ALEXANDRU IOAN CUZA” UNIVERSITY OF IAȘI	<p>“We recently have a new organizational direction and we started a training and mentoring program for smaller organizations in the community that have potential but don't have the resources to grow, I mean <i>know-how</i> and other kinds of connections that we could make and actually we mentor these small organizations in the community, of all types, not only social organizations, but also environmental organizations, and speaking of this ecosystem idea, somehow we can say that we also contribute to this ecosystem in the community. And another dimension that we have is that of advocacy, with various government structures.” (Focus-group participant)</p>



RI4C2

Research & Innovation  
For Cities & Citizens



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101035803

		<p>“Ecosystems are created with people. And another lesson I've learned, rather dearly on my skin, is that absolutely any initiative needs at least one person to lead it and whose focus is 100% on that initiative. As the project with the ‘Kindergarten of managers’ in the area of spin-offs, or in another project, in fact ‘Made in Iasi’ cluster.” (Focus-group participant)</p> <p>“We are now managing this fund for the community in our coalition Bethany, Civica and Fundația Comunitară Iași, it will be like a kind of platform where all these needs, interests will be put and where we hope to come out with a tool, let's say useful, which put together or give direction, a little more cohesive strategy in terms of how the money from the companies that you run in the social sector is invested.” (Focus-group participant)</p> <p>“We, in the social sector, need to learn from the business environment... how to run our organizations... Even if the impact is not economic, it is a social impact.” (Focus-group participant)</p>
6.	UNIVERSITY OF TURKU	<p>“We organize this kind of event in which our academic people, business partners and also our public partners can get together, and have this kind of regular opportunity to meet. It is called ‘Corporate Corner’ because we have companies there and all other partners. There are presentations from different stakeholder groups, and networking. We organise discussions, where people can hear what the others do in companies and in research, and learn about common interests.” (Focus-group participant)</p> <p>“We also support the Corporate Corner with an external newsletter. It doesn't come out that many times per year but usually when we know that have the Corporate Corner coming we do that.” (Focus-group participant)</p>



## ANNEX 5. MEASUREMENT INSTRUMENTS OF CIVIC ENGAGEMENT IN R&I ACTIVITIES IN THE SEVEN LOCAL/REGIONAL KNOWLEDGE ECOSYSTEM

The responses received from the questionnaires and from the focus-group/workshops/debates/discussions/interviews/meetings reinforce the true necessity to bring science outside the University and make scientific language more understandable. At the same time, it is necessary that citizens challenge researchers, entrepreneurs, business owners and policy-makers to reinvent the way they communicate their ideas and projects. Accordingly, citizen science will develop as a mechanism for involving society and stimulating the population's interest in the scientific outcomes, and most importantly contributing to their scientific literacy.

We provide below examples from the Alliance's partners:

NR. CRT.	UNIVERSITY	STAKEHOLDERS' RESPONSES/ANSWERS/OPINIONS
1.	UNIVERSITY OF POITIERS	<p>"I think citizens are curious, so they want to know more. It's up to us to find the right format, the right event to try to bring them to us." (Focus-group participant)</p> <p>"I can't say a lot about citizen's engagement but maybe I can say we use videos on social media, posters in the city because often you walk around and you see something and there's the press in the paper, on TV on France 3." (Focus-group participant)</p> <p>"We do not engage the citizens to the R&amp;I activities because currently we don't have such a need, but in general we can attract citizens in our research to ask if they are interested or not in a particular technology." (Focus-group participant)</p>



		<p>"The researchers in the laboratories can engage citizens, but it depends on the field of the research, sometimes it is applicable, sometimes not." (Focus-group participant)</p> <p>"It is useful for our laboratory; I am convinced that it is part of our mission to make this return to the wide public especially since there is really a curiosity of the wide public for what we do so it's part of our job for me." (Focus-group participant)</p> <p>"I know the number of people who have participated in each of my events and I also know the number of researchers who have come." (Focus-group participant)</p> <p>"As well, there is always a school questionnaire, so students have a little form to fill out every time." (Focus-group participant)</p> <p>"We can say that TV is the most effective. And some have seen the news in the paper, others because they have been told about it often. I think that what works best is when someone you know, for example a friend who tells you to go because it's so good (word-of-mouth)." (Focus-group participant)</p>
2.	UNIVERSITY OF SALAMANCA	<p>"The citizen of the cities that are close to the university is a very simple tool and that is close to us, and it is what you have to play with to know those things and what the needs are and we can offer them." (Focus-group participant)</p> <p>"I believe that the best instrument to measure our work is the final result, which is nothing more than the sum of the success in the different phases." (Focus-group participant)</p> <p>"I think that a measure is given by the attendance of people at the activities that we organize or by the requests that we receive from different institutions to organize workshops or talks." (Focus-group participant)</p>



		<p>"Another measure of our success is given by the fact that when we organize exhibitions we put up a book of dedications and it is always up to the end with comments. The same happens when after organizing an activity through social networks the good reception is expressed." (Focus-group participant)</p> <p>"And finally, our work is valued through the feedback we receive from our colleagues and collaborators." (Focus-group participant)</p>
3.	UNIVERSITY OF COIMBRA	<p>"Citizen participation in research and innovation activities has become a fundamental political priority, in particular through open science and citizen science policies. These actions should also be prioritized in the Knowledge ecosystem of our city, we need to map what exists, and honestly what exists is very little, that is, <i>citizen involvement is much more from the perspective of the end receiver of something that is produced, and not someone who intervenes in the processes and stimulates them. It is necessary to involve citizens in all stages of the process and the scientific method</i> (Vice-Rector Delfim Leão )." (Focus-group participant)</p> <p>"The active participation of citizens in these activities should be voluntary and that it can be encouraged but not coerced. Secondly, this participation requires some form of action on the part of citizens, i.e. they cannot simply be passive recipients of knowledge and/or innovation. Finally, these activities should be, as far as possible, strongly linked to the social mission, trying to find new solutions (products, services, models, etc.) that simultaneously meet society's demands and lead to the best use of existing goods and resources." (Focus-group participant)</p>
4.	"FRIEDRICH-SCHILLER" UNIVERSITY OF JENA	<p>"Of course, data sets can also become much qualitatively and quantitatively higher if citizens, if the qualitative and quantitative power of citizens is taken with them." (Focus-group participant)</p> <p>"There are different forms of citizen participation. In the planning already, we had already mentioned. Or even if we discuss with pensioners what kind of research is being done, maybe there will also be ideas on how to include the hiking club or something. These are all important contacts that then help in the planning to bring citizen science into the project at all. Exactly then the implementation of the research projects. This photographing was an example. And then dissemination." (Focus-group participant)</p>



		<p>"We are also planning it, but we have not yet managed to implement it. So one fear is often that there is a strong gap between researchers and the interested public. That it is always such an instructive relationship and that the interested citizens have to come to the science temples." (Focus-group participant)</p> <p>"To see people not only as a source of data, but also as partners in research." (Focus-group participant)</p>
5.	"ALEXANDRU IOAN CUZA" UNIVERSITY OF IAȘI	<p>"The idea needs to be harnessed somehow, because one of the goals I think we need to have as future collaborators is to make people understand. Citizens don't know what we're doing, that maybe we'll get some feedback from them. You never know what everyone is coming up with. Yes? The bigger the mass, the greater the possibility of something qualitative coming out." (Focus-group participant)</p> <p>"We speak of an ecosystem when people and entities are involved. And when I say entities, whether we mean universities, institutions, companies, it's still people after all and behind them... collaborating for horizontal and vertical development. For example, currently there is, we can talk about an ecosystem in Iași, that we are not aware of it, this is the second part, to a greater or lesser extent, but it on its various components, perhaps larger or smaller or perhaps more disparate.... It exists." (Focus-group participant)</p> <p>"We keep talking about institutions, but in fact ecosystems are created with people. The relationships that I or cluster or... we have with institution X are with 1-2-3-10 people there and what I have learned about ecosystems, it's very important that everybody benefits from them. And in order for that to happen, when the negotiation of membership in an ecosystem takes place, it's important to create an open, honest environment where people can say clearly what they want to get out of it." (Focus-group participant)</p>
6.	UNIVERSITY OF TURKU	<p>"InFlames Flagship (immunology) has as one of its activities to communicate to the society, to other researchers and also to our internal community of what we are doing and what the members of the community are doing. Not all of our researchers know each other well, and we try to bring everyone together." (Focus-group participant)</p> <p>"We are planning to meet with patient organizations this spring and make closer contact with them because they are the link to reach patients and the general public." (Focus-group participant)</p>



RI4C2

Research & Innovation  
For Cities & Citizens



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101035803

		<p>“The plan is to make a group from the patient organizations, and then we will bring our researchers to contact with the patient organizations so that they can discuss together.” (Focus-group participant)</p> <p>“The patient organizations will receive information about what we are doing in research, and researchers will receive information about what patients are looking for and what kind of questions they have for researchers. So, we do this to advance the flow of information.” (Focus-group participant)</p> <p>“There are cases in which representatives of patient organizations have been involved in a funding application as members of the steering board, or in a work package or other activities.” (Focus-group participant)</p>
--	--	--





**RI4C2**  
Research & Innovation  
For Cities & Citizens



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101035803

This report reflects only the author's view and does not reflect the opinions of the European Union or the European Commission. The Agency and the European Commission are not responsible for any use that may be made of the information it contains.