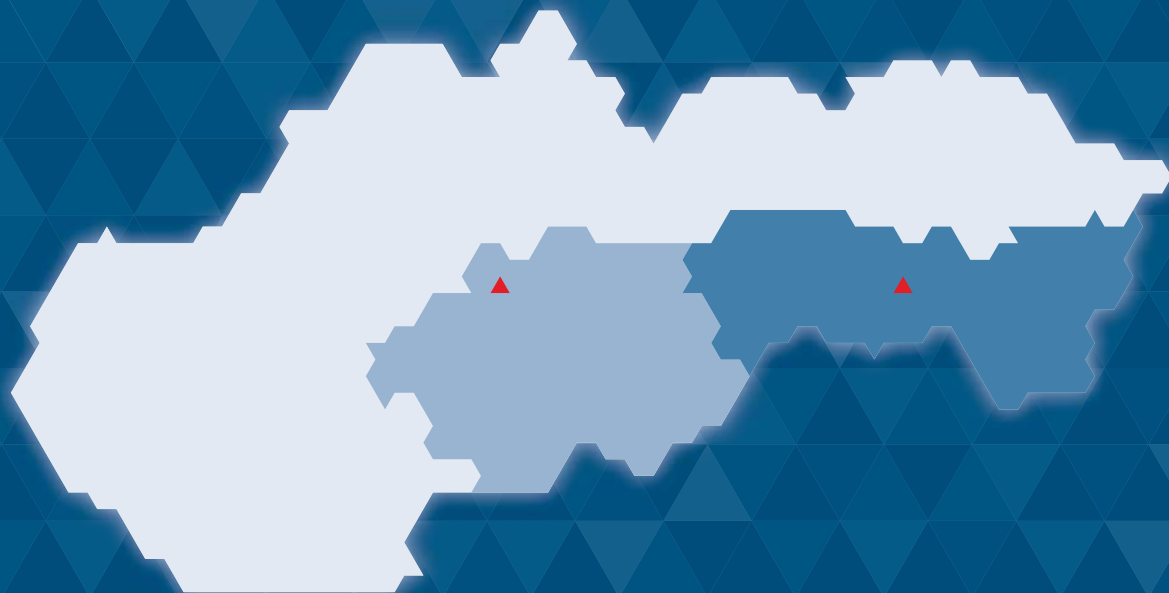


SLOVAKIA CATCHING-UP REGIONS 4

RESEARCH, DEVELOPMENT
AND INNOVATION COMPONENT
BANSKÁ BYSTRICA
AND KOŠICE REGIONS



BANSKÁ BYSTRICA
SELF-GOVERNING REGION



KOŠICE
SELF-GOVERNING
REGION



SLOVAKIA CATCHING-UP REGIONS 4

RESEARCH, DEVELOPMENT AND INNOVATION COMPONENT BANSKÁ BYSTRICA AND KOŠICE REGIONS

(JANUARY 2024)



BANSKÁ BYSTRICA
SELF-GOVERNING REGION



KOŠICE
SELF-GOVERNING
REGION



European
Commission



MINISTRY
OF INVESTMENTS, REGIONAL DEVELOPMENT
AND INFORMATIZATION
OF THE SLOVAK REPUBLIC



THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP

© 2024 International Bank for Reconstruction
and Development / The World Bank
1818 H Street NW
Washington DC 20433
Telephone: +1 202-473-1000
Internet: www.worldbank.org

This work is a product of the staff of The World Bank with external contributions. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of The World Bank, its Board of Executive Directors, or the governments they represent.

The World Bank does not guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of The World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

Rights and Permissions

The material in this work is subject to copyright. Because The World Bank encourages dissemination of its knowledge, this work may be reproduced, in whole or in part, for non-commercial purposes as long as full attribution to this work is given.

Any queries on rights and licenses, including subsidiary rights, should be addressed to World Bank Publications, The World Bank Group, 1818 H Street NW, Washington, DC 20433, USA; fax: +1 202-522-2625; e-mail: pubrights@worldbank.org.

CONTENTS

Acknowledgements	5
Abbreviations and Acronyms	6
List of Figures	7
List of Tables	7
List of Boxes	7
1. INTRODUCTION	9
2. METHODOLOGY	13
3. FOUR PILLARS	17
3.1. Talent and employee development and retention	19
3.2. Business incubation, creation, acceleration and development	20
3.3. Technology and knowledge transfer	22
3.4. Governance, reporting, ecosystem	23
4. ROLES AND RESPONSIBILITIES	27
5. POTENTIAL ACTIVITIES	35
5.1. "Micro grant" program	37
5.2. "ePionier" program	38
5.3. "Proto LAB" program	39
5.4. "Living LAB" program	39
5.5. "Innovation Incubator" program	40
5.6. "MOLANOTE" program	41
5.7. Regional Innovation Observatory	41
6. MONITORING AND EVALUATION	45
6.1. How to choose relevant indicators for RICs?	51
6.2. Data management	30
7. SEQUENCING OF RIC DEVELOPMENT	55
7.1. Support activities for individuals and startups	57
7.2. Support activities for companies	60
8. RIC STRUCTURE	65
8.1. Formal structure	66
8.2. Organizational structure	68
Core team	68
Expert and mentor pool	69
Volunteer pool	70
Subcontractors and partners	70
8.3. Financial structure and sustainability	71
8.4. Budget creation and structure	73

9. APPENDIXES	77
9.1. Concise overview: BBSK RIC (May 2023)	78
9.2. Concise overview: KSK RIC (May 2023)	82
NOTES	85

ACKNOWLEDGMENTS

This report was prepared by a team lead by Grzegorz Wolszczak and comprised of Krzysztof Malicki, Jordanka Tomkova, and Dorota Tekieli-Bisińska.

The team would like to thank Lasse Melgaard, Ellen Hamilton, and Vladimír Benč for their guidance, and Veronika Zimanová and Andrea Millington for their excellent support during the RD&I component implementation.

The team would also like to thank Commissioners Elisa Ferreira for her continuous support to the Catching-up Regions Initiative, Deputy Prime Minister of the Slovak Republic for Investments, Regional Development and Informatization Veronika Remišová, and the Presidents of the Banská Bystrica Self-governing Region, Ondrej Lunter and Košice Self-governing Region, Rastislav Trnka, for their invaluable support, as well as the European Commission's team for their outstanding engagement and support, especially Pascal Boijmans, Katarína Prokopič, Eva Wenigová, Andrej Mikyska, and Lucian Jega.

The team is also indebted to all our counterparts for the support they offered, their excellent collaboration throughout, and their passion for developing the Banská Bystrica Region and Košice Region, especially:

- Office of the Banská Bystrica Self-governing Region: Janka Pálková, Badinska Mariana, Lucia Malová, Silvia Mašlárová,
- Office of the Košice Self-governing Region: Peter Breyl, Barbora Kováčová, Matej Ovčiarka,
- Ministry of Investment, Regional Development and Informatization of the Slovak Republic: Peter Balík, Dušan Velič, Dominika Forgáčová, Karol Schmuck, Lucián Gontko, Marián Cipár, and many others.
- Government Office: Pavel Laczko, Andrea Uhrínová.

The team would like to thank regional companies, NGOs and associational with whom we had the opportunity to exchange comments and observations during conferences, events and workshops.

The report was completed in January 2024.

ABBREVIATIONS AND ACRONYMS

AmCham	American Chamber of Commerce
API	Application programming interface
ALE	Association of Legal Entities
BBSK	Banská Bystrica Self-governing Region
CIKE	Creative Industry Košice
CNIC	Cassovia New Industry Cluster
CVTI	Slovak Centre of Scientific and Technical Information
CuRI	Catching-up Regions Initiative
DG	REGIO Directorate-general for Regional and Urban Policy
DIH	Digital Innovation Hub TECHNICOM
EC	European Commission
ERDF	European Regional Development Fund
ESIF	European Structural and Investment Funds
EU	European Union
GDP	Gross Domestic Product
GIS	Geographic Information System
IIP	Inter-sectoral Innovation Partnership
IPR	Intellectual Property Rights
ITI	Integrated Territorial Investment
JTF	Just Transition Fund
KSK	Košice Self-governing Region
KPI	Key Performance Indicator
KRC	Košice Regional Chamber
KT	Knowledge Transfer
LL	Living Lab
MIRRI	Ministry of Investment, Regional Development and Informatization
M&E	Monitoring and evaluation
MoEdu	Ministry of Education, Science, Research, and Sport
MoEcon	Ministry of the Economy
MSME	Micro, Small, and Medium Enterprises
PaIC	Prototyping and Innovation Centre (part of TUKE)
PSK	Prešov Self-governing Region
R&D	Research and Development
RD&I	Research, Development, and Innovation
RDA	Regional Development Agency
RIC	Regional Innovation Center
RIO	Regional Innovation Observatory
RIS	Regional Innovation Strategy
RIV	Regional Innovation Voucher
RO	Research Organization
SAS	Slovak Academy of Science
SBA	Slovak Business Agency
SCCI	Slovak Chamber of Commerce and Industry
SIEA	Slovak Innovation and Energy Agency
SME	Small and Medium Enterprises
TUKE	Technical University of Košice
TRL	Technology Readiness Level
TTC	Technology Transfer Center
UPJS	University of Pavla Jozefa Šafárika
USP	University Science Park TECHNICOM (operates at TUKE)
VC	Venture Capital
VET	Vocational Education and Training
WB	World Bank

LIST OF FIGURES

FIGURE 1.	Logic of the CuRI3 RD&I Report	11
FIGURE 2.	Knowledge transfer: from research to impact	23
FIGURE 3.	Triple helix model of the innovation ecosystem	29
FIGURE 4.	Division of roles and responsibilities in the innovation ecosystem	30
FIGURE 5.	“Micro grant” program: design	37
FIGURE 6.	Implementation mechanism of the “Micro grant” program	37
FIGURE 7.	“ePionier” program: design	38
FIGURE 8.	“ePionier” program: results	38
FIGURE 9.	“Proto Lab” program: design	39
FIGURE 10.	“Living LAB” program: design	39
FIGURE 11.	“Living LAB” program	40
FIGURE 12.	“Innovation Incubator” program: design	40
FIGURE 13.	“Innovation Incubator” program: results	40
FIGURE 14.	“MOLANOTE” program: design	41
FIGURE 15.	European Innovation Scoreboard 2023: the Slovak Republic	48
FIGURE 16.	European Regional Innovation Scoreboard 2023: Eastern Slovakia (including KSK)	49
FIGURE 17.	European Regional Innovation Scoreboard 2023: Central Slovakia (including BBSK)	49
FIGURE 18.	Elements on innovation ecosystem (Silicon Valley)	58
FIGURE 19.	Recommended sequencing of start	59

LIST OF TABLES

TABLE 1.	Proposed Division of Roles Among the Innovation Stakeholders	31
TABLE 2.	Sample of potential RIC indicators	50

LIST OF BOXES

BOX 1.	Goals of the National RD&I Strategy	14
BOX 2.	Setting up a robust M&E framework	51
BOX 3.	Association of legal entities - key features	67

1. INTRODUCTION

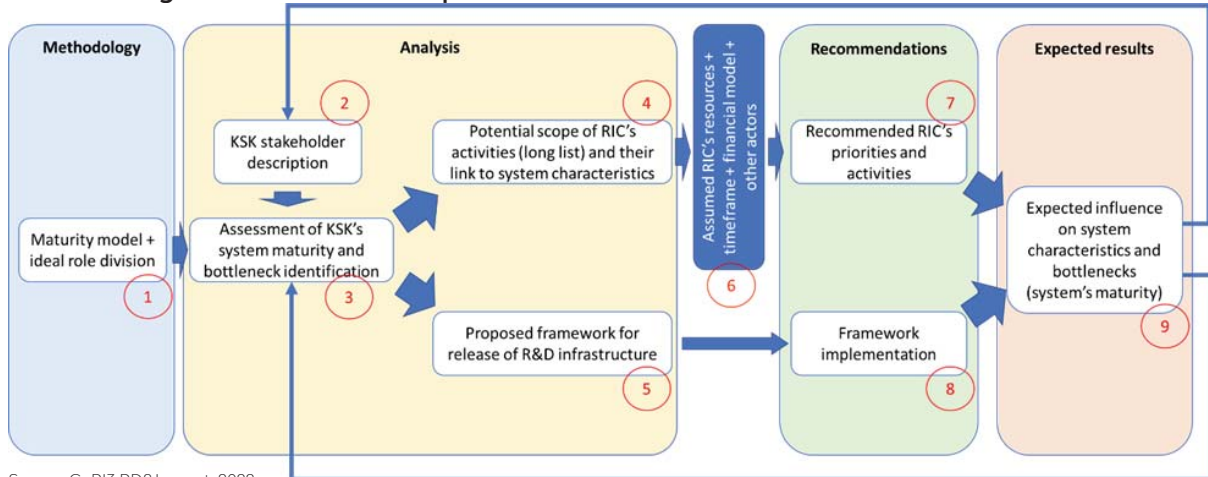
This report is an output of the fourth year of the Slovakia Catching-up Regions Initiative (CuR14) - a component devoted to research, development and innovation (RD&I) that was initiated and financed by the European Commission's DG Regio. It has been prepared by the World Bank (WB) team in collaboration with the Office of the Government of the Slovak Republic and two Slovak regions (Banská Bystrica and Košice). The WB's role in CuR1 is the provision of technical assistance. The report summarizes work completed within the RD&I Component of CuR14 in the period of November 2022 and December 2023. It also builds on the former CuR1 RD&I work presented in CuR12 and CuR13 reports and does not repeat the analyses presented there.

The purpose of this report is to propose a framework for designing and implementing regional innovation centers (RICs) that are based on four pillars: talents, companies, knowledge transfer, and governance and ecosystem development in Slovak Republic-specific conditions. These pillars respond to challenges and opportunities identified in Banská Bystrica and Košice Self-governing Regions (BBSK and KSK, respectively) during the previous CuR1 editions (CuR12 and 3).

The CuR12 RD&I work was dedicated to research and development (R&D) collaboration between academia and industry in BBSK and also provided an overview of the national programs supporting this area. Key recommendations pertained to i) setting up a RIC, ii) testing a regional innovation voucher scheme, and iii) establishing a prototyping space for to-be-innovators, the innolabb. Additionally, it laid foundations for developing the framework for releasing RD&I infrastructure, which Slovak research organizations purchased with public resources (including EU funds) and did not utilize for commercial purposes. As a result, an inter-ministerial working group was set up by MIRRI to tackle this topic. Based on this work, the BBSK regional innovation voucher was designed and tested together with SIEA (value of provided vouchers: EUR 1M) and then this instrument was scaled up to the whole country and several rounds were implemented. BBSK also established the Innolabb, which has been expanded since then to several similar entities across the region.

The CuR13 RD&I component focused on two pillars (Figure 1). First, it proposed a model for assessing the maturity of the knowledge transfer systems in both BBSK and KSK and helped identify key bottlenecks for their ecosystem development. These led to proposing pillars for potential RICs' activities as well as roles and responsibilities within their respective knowledge transfer systems. Second, it finalized the framework for releasing R&D infrastructure. The framework was successfully tested at the University of Pavla Jozefa Šafárika (UPJŠ) in KSK and it was also shared with the national level. In parallel to these activities, the World Bank team provided just-in-time support to further developing and operationalizing RICs in both regions.

FIGURE 1: Logic of the CuRI3 RD&I Report



Source: CuRI3 RD&I report, 2022.

Reflecting on the CuRI work, the government of the Slovak Republic dedicated an envelope of EU funds in the Program Slovakia under Policy objective 1 (measure 1.1.1.) for developing regional innovation systems¹. These funds come from the European Regional Development Fund (ERDF) for the programming period 2021-2027. The regional envelope in the measure 1.1.1. amounts to approximately EUR 80 million and both BBSK and KSK have an allocation of roughly EUR 10 million each.

The measure 1.1.1. will be implemented through a vehicle called an 'intersectoral innovation partnership' (IIP). Its exact definition will be provided in a description of the call for proposal for the measure 1.1.1., which is being prepared by the Ministry of Investment, Regional Development and Informatics (MIRRI) of the Slovak Republic. In principle, IIPs are to stimulate regional collaboration among stakeholders of the innovation ecosystem (quadruple helix). The IIP formula is expected to be flexible and will allow for institutionalized forms of collaboration (a separate legal entity) and non-institutionalized ones. In BBSK and KSK, the IIPs will take the form of RICs.

The financial envelope of measure 1.1.1. will be a crucial element of RICs' funding mix during initial years of their functioning. While RICs are also likely to use other financing (e.g. regional budget, JTF, external projects, partnerships with the private sector, commercial revenues), the design of the measure 1.1.1. will significantly impact RICs' structure and activities. In anticipation of publishing the measure 1.1.1., both regions established teams tasked with supporting innovation and coordinating regional innovation ecosystems, and have been co-financing innovation-related activities during the last 1.5 years.

2. METHODOLOGY

Based on analyses conducted in both regions during CURI2 and CURI3, the WB team collaborated with KSK and BBSK to develop logical frameworks for their respective RICs. In both cases, these consisted of the following building blocks: i) an overarching vision, ii) a theory of change, iii) key expected outcomes or higher level goals and their operational outputs or KPIs, as well as iv) key activities, and v) roles and responsibilities of different stakeholders in the RICs' daily operation. The summary of this work was presented in the format of short descriptions for both regions that were prepared in mid-2023. They are included in the annexes of this report. These summaries based on information pertaining to the measure 1.1.1. that was available at that time. Some of the assumptions and activities in these summaries have already changed, to accommodate the dynamic discussion on the measure 1.1.1. This work was followed with drafting the RIC budget and estimating staff requirements for envisaged activities.

RICs' vision and KPIs are closely aligned with the priorities of national and regional policies, strategies and programs such as the Research and Innovation Strategy for Smart Specialisation of the Slovak Republic 2021-2027 (SK RIS3 2021+)², the National Strategy for Research, Development & Innovation 2030+³ (Box 1), the 2030 Digital Transformation Strategy for Slovakia⁴ and at regional level the Integrated Territorial Investments (ITIs) and Regional Innovation Strategies (RIS)⁵. It is noteworthy that RICs are unprecedented in both regions. Hence, they will be the first generation of institutions focusing on innovation in both regions' history.

BOX 1: Goals of the National RD&I Strategy

The Slovak Republic's National Strategy for Research, Development & Innovation 2030 (approved in March 2023) has the following SMART goals:

- Increase public RD&I spending by an average rate of 14% per year until 2030, reaching €1 billion by 2030.
- Intensify private investment RD&I from 0.5% to 1.2% GDP and over time up to the EU average of 2% (currently 0.9%, one of the lowest in the EU).
- Move Slovakia from 24th to 14th place in the European innovation ranking.
- Increase trust and collaboration across the research and innovation ecosystem.
- Move to an economic model of an innovative country with a 2.2 times return on investment volume to the state budget by 2048.
- Reverse the outflow of human capital and attract highly qualified people and companies - 25,000 by 2030.
- Increase Slovakia's social trust by increasing a better quality of life.

Source: National Strategy for Research, Development & Innovation 2030, 2023.

3. FOUR PILLARS

This report recommends organizing RICs' activities around four pillars that have been identified during CuRI work. These are the following:

1. **Talent cultivation:** Talent / employee development and retention, development of ideas (focus on individuals)
2. **Enterprise development & scaling:** Business incubation, creation, acceleration and development (focus on established companies - not only startups but also mature SMES)
3. **Knowledge transfer:** Technology and knowledge transfer (collaboration between - mainly - academia and enterprises)
4. **Governance, data, ecosystem:** Governance, data gathering and analyses reporting, spurring collaboration among stakeholders (more systemic collaboration and information creation)

These four pillars are relatively broad and can be made more specific and tailored to regional needs through adaptation of activities under each of them. Other Slovak regions may also see it suitable to have more or less pillars, depending on their needs, maturity and context. The proposed pillars interact and complement each other and they were selected to provide a comprehensive assistance to developing a regional innovation ecosystem that can be influenced by RICs. Talent constitutes the foundation for any innovative activities and is the broad basis of the ecosystem - both for enterprises and academia. Enterprises build on talent (as company owners, employees) and implement innovation through their own activities and collaboration with academia. An environment (ecosystem) that stimulates and facilitates these interactions and processes is an important 'background'.

The four pillars were selected to support in a balanced way all individual elements of the multiple helix that can be influenced by RIC's activities. The first pillar relates to supporting the creation and growth of regional talent, or in other words, to the development of skills required to generate and absorb innovation. The second pillar covers all activities aimed at building strength and maturity of local businesses and industry. The third pillar focuses on facilitating the broadly understood flow of knowledge from academia to the ecosystem. Pillar four covers the elements related to the government, including local administration.

Across the Slovak regions specific activities may differ as the regions are at different maturity levels and have different circumstances but the four thematic pillars are pertinent. These pillars complement each other and are interlinked, hence delineating specific activities under a specific pillar is not always easy. During the CuRI work, the proposed division emerged to offer a clear planning and implementation framework as well as to accommodate requirements of expected funding sources. The latter is made of a mixture of potential funds, including 1.1.1 activity of Program Slovakia, JTF, regional budget, as well as external project financing and private sector investments. The pillars have arbitrarily defined boundaries that are explained below. The purpose of this structure is to order RICs' expected activities and targets, and to signal that these four pillars are important for developing regional innovation systems. Finally, such a division helps with further steps, i.e. budgeting and task planning. These two elements then clearly indicate what the main focus of a RIC is, which in turn might be a useful tool to check whether this focus is in line with initially identified regional challenges in the field of innovation.

The proposed pillars expand the recommended scope of RIC activities in relation to the proposal included in the CuRI3 report, which focused primarily on activities directly related to the transfer of knowledge and R&D collaboration, mainly in the relationship between research organizations (ROs) and industry. This is mainly due to the need to take into account an evolving Slovak environment, and a framework resulting from the rules of the measure 1.1.1. The latter is expected to be the first substantial and dedicated source of financing for regional innovation ecosystems (including RIC's activities) in the coming years.

Notwithstanding the above, the fundamental purpose of the existence and operation of RIC, as well as the bottlenecks and challenges identified in the earlier reports, remain unchanged. The role that RIC should play in the local ecosystem of innovation and knowledge transfer also remains unchanged. The understanding of the extent to which RIC should support the development of the ecosystem has, however, expanded. Previously it was limited to supporting the cooperation between ROs and industry (knowledge transfer). This report broadens the scope of activities recommended for RICs and it advocates for including such areas as building and maintaining a talent pool, creating and developing businesses, beyond the area directly related to the knowledge transfer or R&D, and spurring and coordinating the collaboration in the regional ecosystem.

Finally, in these four pillars and subsequently presented activities, RICs will play a different 'institutional role'. In the CuRI3 RD&I report three institutional roles were defined: designer, implementer and facilitator (also understood as coordinator and contributor). This differentiation reflects the depth and breadth of RICs' engagement in specific activities and influences the amount of resources and effort RICs will devote to them. RICs can play more than a single institutional role in relation to activities they are engaged in. Assumption of these institutional roles by RICs will depend on regional context, their resources and strategic objectives, and already existing institutions and role division in a specific region. These varying degrees of involvement should be kept in mind when designing RICs' scope of responsibilities and activities. They will be dynamic and will evolve in time through the process of interaction with stakeholders of regional and national innovation systems.

3.1. TALENT AND EMPLOYEE DEVELOPMENT AND RETENTION

Rationale: It is an obvious statement that behind every mature and effectively functioning innovation ecosystem there are relevantly skilled people driving it. It is not possible to create such an ecosystem without well-educated and experienced employees, scientists and officials. It is not possible to keep such people in the region or attract them to the region without providing them with continuous opportunities to improve their qualifications and to find high-quality jobs. It is also not possible to attract companies and investments to the region without ensuring that the region is able to continuously provide such high-quality staff with adequate skills as the result of the existence of a good and efficient education system, enabling not only the acquisition of knowledge, but also of experience.

Objective: The main goal of this pillar is to provide support and coordination in building, attracting and retaining a talent pool, starting from the primary education level and ending with improving qualifications of employees and to-be entrepreneurs. This pillar is therefore focused on natural persons and embraces actions aimed at providing such persons with the opportunity for comprehensive education and development in the region. This pillar should support both the development of entrepreneurial skills and attitudes, resulting in the creation of start-ups, as well as the development of highly qualified employees, necessary to ensure the growth of existing enterprises. The goal of the activities undertaken under this pillar is not to duplicate the functions already offered by the educational units operating in the region, but to complement their efforts in order to offer a coherent development path and to supplement this path with elements not offered as part of educational programs (e.g. incubation and acceleration of business ideas).

This pillar addresses the bottlenecks identified in the previous reports related to “Challenges with upskilling and retaining talent in the region”, “Retention of local talent will require a longer-term, comprehensive, multi-track approach” and “Employers have increasing difficulties in recruiting and retaining qualified, motivated staff”.

Beneficiaries: Pillar one focuses on individuals, this is a broad definition that may include pupils, secondary and university students, individual employees, researchers as well as administration officials. The key differentiating factor here is that these individuals are not supported as a part of a company, research organization, etc. In other words, the support within this pillar should be provided directly for such individuals not for their organizations. It also implies that a cut off point for this pillar is setting up a start-up or joining a formalized research team. Past these specific points, activities under other pillars could be used to support their further development.

Scope of support: This pillar targets development of individual skills, especially related to creativity, innovativeness, leadership, prototyping, teamwork, entrepreneurship, but could also include technical training, such as specific software, use of 3D printers, use of, design and creation of electrical circuits etc. It also helps individuals network with each other, with mentors and their potential employees, for instance by participating in challenges oriented at solving problems. The objective of this area is not to support certain businesses but rather skills required to build and grow such businesses (e.g., via providing incubation or acceleration programs). Talent cultivation and upskilling will be also contextualized to the region and market driven. For instance, in addition to entrepreneurship, BBSK plans to integrate four types of so-called future skills into its support programs by: problem-solving, self-management, working with people, and technology use and development.

Depending on the region and its current needs or ecosystem maturity level, this pillar may be understood even more broadly, as ensuring a high standard of living for the region's inhabitants, encouraging them to link their future with the region. However, such activities remain beyond the scope of the CuRI R&D project as well as beyond the capabilities of RIC, which is why we only refer to them in this document without further consideration. They require the cooperation of all stakeholders listed in the multiple helix. For example, retaining talent is not something that can be addressed with a single program provided by RIC such as training or incubation. Impactful retention and cultivation of talent pool requires opportunities in a wide range of fields, for instance: (i) affordable housing, (ii) high quality education, (iii) jobs offering competitive salaries, (iv) high quality public services, (v) flexible and competitive employment conditions (e.g., remote or part-time employment), (vi) financing instruments (e.g., micro-loans, guarantees and grants for R&D or experimentation), (vii) motivational incentives that award entrepreneurial activities as well as continuous monitoring and evaluation of regional talent pool dynamics and performance to be incorporated in policy and programing cycles. Thus, the support provided in this pillar by RIC should be coordinated with the support provided by other organizations or entities, including the central administration.

3.2 BUSINESS INCUBATION, CREATION, ACCELERATION AND DEVELOPMENT

Rationale: Active private sector and industry form an instrumental building block of the vitality and success of a mature economy. These include sole proprietorships or start-ups established by individuals with entrepreneurial mindset, SMEs and local or global corporations. Companies absorb, utilize, develop, and further diffuse knowledge produced by ROs as well as the talents available on the local market. They innovate through the elaboration of novel products, services, and marketing and business models. Innovations help enhance their productivity that results in higher competitiveness and ability to grow their market share. Sustainable growth of innovative businesses, in turn, translates in more (and usually better) jobs at the local market and increased tax revenues. This impacts regional GDP as well as other intangible factors, for instance the economy's appeal or life quality to young and/or talented people. Acting as investors, companies also play a catalytic role in financing local innovation and ideas.

Objective: The main goal of this pillar is to stimulate the development and growth of local companies. This pillar should be understood broadly and it should include sole proprietorships and start-ups, as well as mature companies operating in the region. Activities undertaken under this pillar should not be limited only to supporting locally established companies, but also actively attracting to the region global corporations looking for attractive places to locate their branches. The spectrum of interventions should be adapted and tuned to different stages of companies' development, which in the case of start-ups may include an offer of incubation and acceleration programs, and in the case of SMEs, an offer of business consulting or programs supporting the implementation of innovations or international expansion.

The goal of the pillar is not to replace or compete with support programs already provided by other stakeholders, e.g. central administration. However, the country-wide support programs tend to be more general due to their territorial scope and, in turn, a broader range of beneficiaries' needs. Smaller (regional) scale and more tailored interventions could better suit local entrepreneurs. Actions undertaken under this pillar should rather aim at identifying and combining already available programs, their coordination and selective supplementation, in order to create a comprehensive support path for companies addressing their needs through various stages of their development and growth.

An independent goal of this pillar may also be to promote the offer of companies and the region on the national and international arena. Activities in this area may include the previously mentioned attracting global companies to the region, but also building access to an international network of business angels and investment funds for the purposes of creating and strengthening the local start-up ecosystem.

This pillar addresses some of the bottlenecks identified in the previous CuRI RD&I reports related to SME support (CuRI2 and CuRI3).

Beneficiaries: This pillar should be focused mainly on supporting the companies on different stages of their development. The key differentiating factor here is that this pillar is focused on legal entities and their internal needs and shortages related to overcoming internal barriers to growth and development. In other words, specific cut off points for this pillar are actions aiming at creation of a new company or bringing the company to the region, as well as providing support for companies already operating in the region. Past these specific points, activities under other pillars could be considered.

Scope of support: This pillar targets local business incubation, creation, acceleration and development, so the scope of support is very broad. In practice it will depend on the regional strategy and may vary in time. If building a start-up ecosystem is an element of the strategy, the scope should include designing and offering incubation and acceleration programs as well as building access to international networks of business angels and investment funds. If part of the strategy is to strengthen companies already operating in the region, the scope may include a wide range of consulting and training services contributing to the creation of innovation and increased competitiveness, organization of business missions, organization of brokerage meetings, support for market research or trade fair presentations and professional promotions on new markets. Regardless of the above examples, independent activities should be planned to promote the region and the companies operating in it on the national and international arena.

An important element should be the coordination of support coming from various sources, already available for local businesses. The focus should be on complementing such support in order to create a comprehensive offer for companies at subsequent stages of their development. It is also essential to balance the intensity of support and allocated resources depending on the number of companies at particular stages of development.

3.3 TECHNOLOGY AND KNOWLEDGE TRANSFER

Rationale: Knowledge transfer systems involve inclusive, multi-stakeholder processes where entities can and want to freely exchange ideas, to jointly solve problems and to share pooled benefits stemming from their respective membership. Well steered knowledge transfer systems pro-actively map regional innovation assets and catalyze strategic partnerships within them in order to expand their relevant synergies, opportunities for upscaling and specialization while lowering the associated risks with innovation.

Although not every innovation is the result of the implementation of R&D results in industry, innovations of this type predominate in economies generating high margins. R&D work may be carried out directly by ROs and offered to the industry, e.g. in the form of patents, or by companies, e.g. based on the infrastructure, knowledge, research or training delivered by ROs.

Objective: The main goal of this pillar is to support and coordinate the broadly understood flow of knowledge from ROs to industry. Such flow should, as often as possible, take the form of long-lasting cooperation between ROs and industry. Such cooperation should include both the licensing of intellectual property already available and registered in ROs, but also the creation of joint research projects based on research infrastructure and scientific staff available in ROs. In the case of research infrastructure, an independent objective should be to promote and support the release of such R&D infrastructure for commercial use⁶.

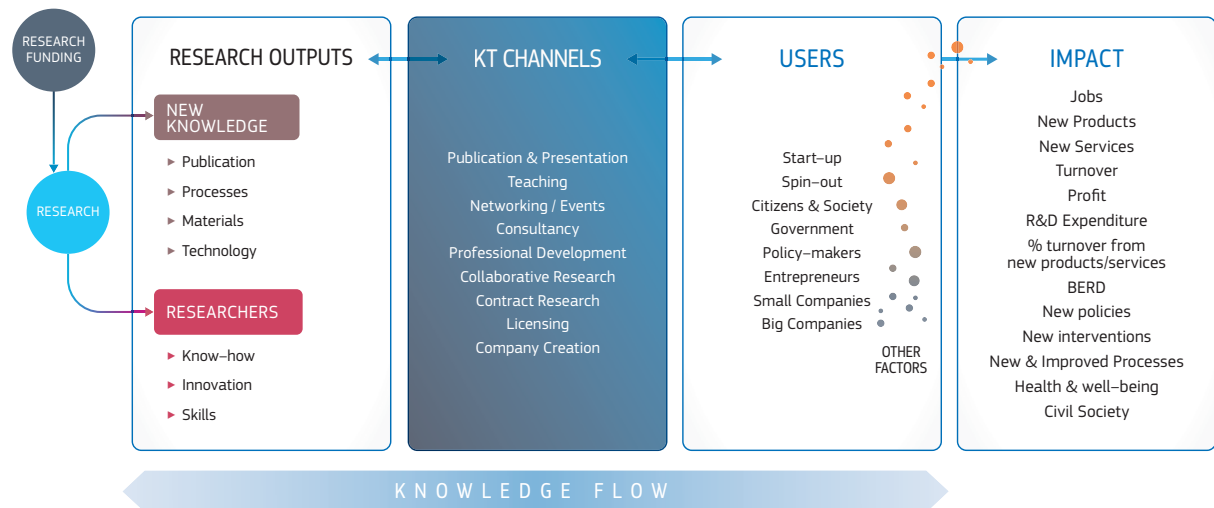
As part of joint research projects, it is important to support the creation of research teams consisting not only of scientists, but also involving students. Research challenges should mainly be determined by the needs of industry, but they can also be generated based on the development needs of the region and administration.

It should be noted that activities undertaken under this pillar by RIC should not release ROs from the responsibility for proper preparation for the commercialization of their intellectual property and building their own research offer, as well as seeking funds to finance such activities. Similarly, the companies should independently look for sources of financing for their research projects. The goal of activities undertaken under this pillar is to provide targeted support and coordination of efforts undertaken by other ecosystem stakeholders.

This pillar addresses the bottlenecks identified in the previous reports related to “Trust and collaboration within regional innovation ecosystem”, “Companies located in the region, especially from the SME sector, are rarely and rather reluctant to engage in R&D cooperation due to high uncertainty, bureaucracy, lack of knowledge and experience in working with ROs”, “ROs business development units, systems and procedures are inadequately pro-business oriented to provide efficient modalities of collaboration with attractive, competitive business offers”, “Cooperation with scientists is perceived by entrepreneurs as cumbersome, time-consuming and risky vis-a-vis possible results” and “Modern equipment and research infrastructure owned by research organizations is not widely available for commercial use”.

Beneficiaries: This pillar should be focused mainly on supporting the building of relationships between ROs and companies / administration. In this approach, it should equally support enterprises looking for opportunities to cooperate with ROs and ROs looking for opportunities to cooperate with companies / administration. The key differentiating factor here is that this pillar is focused on fostering trust, relations, flow and cooperation between entities coming from academia and industry / administration rather than on supporting these entities independently. In other words, a specific cut off point for this pillar is bonding entities together. Past this specific point, activities under other pillars could be considered.

FIGURE 2: Knowledge transfer: from research to impact



Source: Campbell, A., Cavalade, C., Haunold, C., Karanikic, P. and Piccaluga, A. (2020) *Knowledge Transfer Metrics - Towards a European-wide set of harmonised indicators*, Karlsson Dinnetz, M. editor(s), EUR 30218 EN, Publications Office of the EU, Luxembourg.

Scope of support: This pillar targets building the long lasting and mutually beneficial business relations between ROs and industry / administration. Support should be focused not on financing the implementation of research projects, but on building mechanisms enabling the creation and preparation of such projects. For example, it should include promoting the existing ROs offer, identifying and promoting the needs of companies and administration, identifying regional research challenges, searching for and supporting access to sources of financing for research projects, support in preparing project applications (e.g. for European funds), support in navigating between available programs, support in releasing existing research infrastructure, promoting the creation of joint research teams.

An important element should be the coordination of support coming from various sources, available to various stakeholders in the regional ecosystem. The focus should be on complementing the support already provided by or available for other stakeholders in order to create a coherent and comprehensive trust and cooperation building ecosystem.

3.4. GOVERNANCE, REPORTING, ECOSYSTEM

Rationale: Previous CuRI RD&I reports highlighted an insufficient level of trust as one of key inhibitors of collaboration (and communication) among innovation stakeholders. This phenomenon is accompanied (and could also be reinforced) by a limited amount of regularly updated and accurate data about the regional innovation ecosystem. That, in turn, makes it difficult to monitor the results of innovation support measures and evaluate their effectiveness and efficiency. Three key insights regarding availability of regional innovation data were formulated during CuRI. First, a sizable proportion of regional innovation relevant data already does exist, but much of it still needs to be collected. Moreover, it is not readily available, nor structured for systematic and conclusive performance monitoring. Though useful regional profiles, such as the 2022 RD&I Sector in Slovakia produced by SARIO⁷, do exist, they are not granular enough to capture the dynamics and nuances of Slovak regional innovation ecosystems. On the opposite side, while the interactive Data Cube⁸ hosted by the Slovak National Statistical Office provides potentially adequately granular datasets related to innovation ecosystems, it is rather complex to navigate, especially for external users such as investors or the regular citizens. Second, there is a tendency of duplication and fragmentation in data collection by different regional stakeholders. Many are either collecting similar data or are not proactively sharing what could be useful to others. In other words, different organizations and associations may ask the same stakeholders to provide the same (relatively basic) data, because they

don't know they are already available. This leads to duplicative efforts and does not promote deep dives into specific fields. Third, coordination, promotion and excitement about usage of data could be further promoted. While commendable icebreaking regional initiatives are being implemented, such as KSK's GIS portal, also supported by CuRI, or a new project on open data in BBSK, they are not yet optimally leveraged for diverse purposes - be it by industry, universities or by the public.

The lacking trust and limited information flow inhibits contacts in the ecosystem which leads to the fact that stakeholders do not know each other and do not spontaneously reach out to each other. CuRI RD&I reports concluded that regional ecosystems in BBSK and KSK lack a regional coordinator or facilitator, who could jump start and stimulate interactions among regional stakeholders.

Objective: This pillar focuses on creating an enabling regional environment for initiating, nurturing and scaling regional innovation. Vital elements of this area are the following: i) promoting inclusion of stakeholders in decision-making, for instance defining strategic vision and objectives of the regional innovation ecosystem, ii) arranging governance structure that engages regional stakeholders into vision implementation and divides roles and responsibilities among them, iii) generating and analyzing data and information about the regional innovation system and sharing it with stakeholders, iv) attracting innovation-related funds to the region, either through mobilizing investors (e.g. venture funds) or applying for projects (e.g. measure 1.1.1., Interreg, Horizon Europe), v) facilitating collaboration among stakeholders through networking within the region and internationally, and vi) branding and promoting regional innovation activities.

Beneficiaries: While three previous pillars focus on individuals (society), enterprises, academia, this pillar, in principle, pertains to broadly understood 'administration' and completes the multiple helix mode. 'Administration' refers to regional and local authorities as well as intermediary organizations that support regional innovation. Since RICs in KSK and BBSK are conceived as entities responsible for these specific tasks they are the key focus of this pillar, however, not the exclusive one. Indirectly this pillar also involves all other stakeholders, since governance structure, data gathering, monitoring and evaluation, and collaboration require the engagement of a whole spectrum of regional stakeholders.

Scope of support: This pillar targets building trust among stakeholders of the regional innovation ecosystem that bases on inclusive governance structure (planning and implementation), collaboration, information flow and transparent data. The range of support under this pillar is broad because it concerns a potentially broad spectrum of stakeholders. The pillar supports establishing platforms for regular communication and inclusion of regional stakeholders that could take the form of regional innovation councils or advisory / consultative entities to regional authorities. An example of that could be *Kraj30* in KSK, which gathers 30 prominent regional enterprises and research organizations to discuss key aspects of regional innovation policy. Data gathering, analysis and its publication is another key aspect of this pillar. Knowledge creation and regular monitoring and evaluation require systematic efforts that often are neglected and underestimated. Hence the WB team recommends establishing regional innovation observatories that for instance RICs could manage and its tasks could be implemented in collaboration with regional partners. This pillar also supports collaborative activities that bring stakeholders together, this could include organization of regional events, study visits, trade fair travels, memberships in networks. For example, both BBSK and KSK have begun to successfully organize innovation meetups. The objective of the meet up is to support informal networking, sharing knowledge and experiences and building trust among regional universities, ROs, regional SMEs, startups and administration at regional and national levels. Such meetups are an important element of establishing new relations that can lead to collaborations and partnerships among different stakeholders in the innovation ecosystem. While RIC is envisaged as a coordinator of the ecosystem, this pillar should allow RIC to incentivize stakeholders to contribute to realization of its goals, e.g. through outsourcing certain tasks to them, e.g. conducting surveys, preparing analyzes.

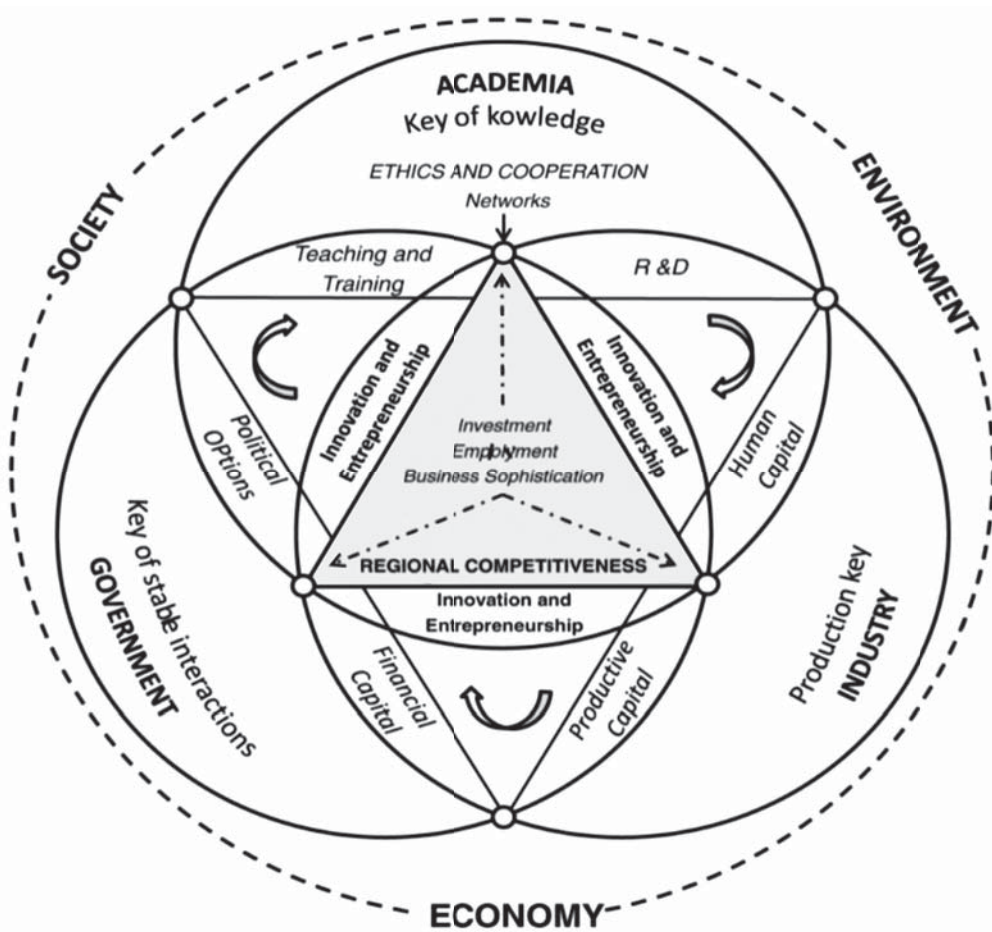
4. ROLES AND RESPONSIBILITIES

The above sections related to pillars and activities, and proposed thematic content that could be carried out to support innovation in the regional ecosystem, i.e. the ‘what’; the current section discusses roles and responsibilities in the regional ecosystem, i.e. ‘who’ should act. Most proposed thematic areas and activities require the cooperation of regional stakeholders, who may assume different ‘institutional roles’ in their implementation (as explained above). It should also be remembered that these roles may change with the evolution of the innovation ecosystem or the availability of specific support programs.

Due to the differences between regions, specific responsibilities and tasks assigned to RICs will differ. These differences include for instance (i) the level of maturity of the ecosystem, (ii) key stakeholders operating in the region and their capacity, (iii) services already provided and their quality, (iv) institutional framework of the ecosystem, (v) the legal form of RIC, (vi) regional objectives included in regional innovation strategy. Despite this heterogeneity, it is possible to indicate an approach to follow.

As a starting point, this report proposes adopting the multiple helix model. This approach defines basic relationships between universities (academia), companies (industry) and administration (government) embedded in a specific socio-economic and natural environment. The multiple helix model is general in nature and comprehensively covers interactions occurring in the ecosystem (Figure 3).⁹ However, the scope of the CuRI RD&I project focuses mainly on relations related to supporting innovations resulting from RD&I activities or, in a broader sense, knowledge and technology transfer. The multiple helix model implies that different actors have different competences and resources, hence they have specific strengths to perform specific activities or a specific role/function in an environment that requires collaboration of several stakeholders.

FIGURE 3: Triple helix model of the innovation ecosystem



Source: Compagnucci L, Spigarelli F (2018) *Fostering cross-sector collaboration to promote innovation in the water sector*. Sustainability 10(11):4154

In the Slovak Republic context, academia, business and administration seem the most prominent actors of regional innovation systems. Figure 4 presents an exemplary division of roles, risks and responsibilities between these stakeholder groups that could be assumed in the innovation ecosystem. These build on the multiple helix model and actors' missions and comparative advantage. Academia's role is to invent, i.e. create new knowledge and be open to sharing it with other stakeholders. Business role is to innovate, i.e. use knowledge to create new solutions. Finally, administration's role is to support the innovation ecosystem, which can be done in a number of ways, e.g. through creation of regulatory environment (national level), provision of support measures (national and regional), acting as a first customer. Within this framework, RICs as well as intermediary organizations, including intersectoral innovation partnerships (IIP), fall into the 'administration' group, although institutionally they don't have to be a part of regional or national administration. Figure 4 also provides two examples of inadequate role assumption in an innovation ecosystem that lead to overstepping one's specialization, hence losing one's comparative advantage in that specific area. Such conflicts usually result in suboptimal use of resources and create mistrust among stakeholders and are recommended to be avoided.

FIGURE 4: Division of roles and responsibilities in the innovation ecosystem



Source: Authors, 2024.

Stakeholders' responsibilities can be further specified by describing exemplary activities that are typical to them. Table 1 presents a set of activities assigned to four stakeholder groups. These activities are presented with consideration to the specific context in which RICs in BBSK and KSK operate. Such a framework includes national and regional innovation strategies and their regulatory and institutional context, activities that are envisaged or considered as RICs' tasks, and broader context of their respective regional innovation systems.

A direct conclusion of such a division is that RICs are not able and should not try performing activities in all areas, since it would be counterproductive. On the contrary, RICs should be clear about their specific roles and activities in the ecosystem, and especially in the initial period of their functioning, should keep them narrow. An attempt to engage in all possible activities would overstretch RICs' limited resources and would eventually lead to their failure. Moreover, overstepping RICs' mandate (role), would likely generate unnecessary competition with other stakeholders and create mistrust, instead of trust - and the latter is one of RICs' main objectives in incipient regional innovation systems. Activities presented in Table 1 are grouped by stakeholder types and not by the RICs' pillars introduced above.

BBSK and KSK RICs will fulfill the definition of intersectoral innovation partnerships (IIPs) as described in the Program Slovakia. While they have different legal forms and formal composition but similar envisaged scope of actions. IIPs' role is to become collaborative platforms for multiple helix stakeholders that bring various actors together and facilitate their joint actions, which is to strengthen regional innovation ecosystems. The IIP concept assumes active participation of academia, business, government and the social sector. Formal institutionalization of an IIP is, according to a draft description of the measure 1.1.1., not required. Because of their diverse 'membership', IIPs' roles are not neatly aligned with a single group of stakeholders. They will play a facilitating role in the regional innovation system and their roles will overlap with the purview of public administration and intermediary organizations. Table 1 indicates roles that seem suitable for IIPs in bold font. IIPs will not be responsible for carrying out roles assigned to business or research sector, especially ones pertaining to purchasing R&D infrastructure and carrying our research.

TABLE 1: Proposed Division of Roles Among the Innovation Stakeholders

Stakeholder group	Role
Regional / Local public administration	1. Coordinate and manage an inclusive regional strategy creation and implementation process 2. Encourage creation of frameworks for communication and coordination among the stakeholders (e.g., regional networks, regional technology clusters) 3. Create frameworks for business risk mitigation when implementing R&D-based innovations (e.g., being a first customer) 4. Create or lobby for sub-national and national support programs supporting regional strategy, attract other relevant investment opportunities for innovation projects 5. Promote innovative culture within the region 6. Promote the region and its innovation offer outside the region 7. Create "quality of life" related conditions to attract and retain people in the region 8. Create conditions to attract companies to locate their business in the region 9. Create conditions for growth of local business 10. Monitor and increase the level of inclusion (e.g., individuals, stakeholders, urban and rural areas)
Companies	1. Create and implement R&D based innovations (take the business and financial risk of innovation activity) 2. Create demand for R&D services and intellectual property rights (IPR) developed by ROs 3. Create demand for skilled labor force and offer high-quality jobs 4. Support creation and implementation of the Regional Innovation Strategy and innovation programs 5. Focus on growth and expansion, hence contribute to region development 6. Define its RD&I-related needs and communicate them to other stakeholders 7. Get involved in activities of relevant and well-functioning intermediary institutions
Research organizations	1. Invest in, operate and maintain R&D infrastructure 2. Conduct high quality own research (both basic and applied) to develop and protect IPR (take the research risk on lower technology readiness levels (TRLs)) 3. Train both academic and administrative staff to prepare them for knowledge transfer 4. Prepare internal procedures allowing collaboration with the private sector 5. Provide competitively-priced and high quality R&D services to meet the demand 6. Provide high quality labor force for the region (attract young people to study in the region) 7. Support lifelong learning programs 8. Support creation and implementation of the regional innovation strategy 9. Contribute to growth and development of the region (focus on impact)
Intermediary organizations	1. Create and facilitate frameworks for communication and coordination among the stakeholders (e.g., regional networks, regional forums, regional technology clusters) 2. Identify, aggregate and communicate RD&I-related needs of companies 3. Represent groups of stakeholders in relations with the regional (and national) administration 4. Represent groups of underrepresented stakeholders in the innovation environment (increase the level of inclusion) 5. Coordinate own work program with other regional stakeholders (avoid duplication, look for niches, provide value added) 6. Create or lobby for support programs oriented for building trust and cooperation in the region. 7. Provide basic and specialized trainings, expertise, and guidance for entrepreneurs and companies, either by inhouse experts or external collaborators 7. Support creation and implementation of the regional innovation strategy 9. Promote innovative culture within the region 10. Promote the region and its offer outside the region
Society / citizens	1. Demand efficient and effective public services and monitor their results 2. Help identify challenges to be tackled by innovative solutions 3. Engage in creating solutions and innovation 4. Provide feedback on implemented measures

Roles that could be assumed by IIPs are indicated in bold.
 Source: CuRI3 RD&I Report, 2022.

Table 1 is recommended to be used as a guideline for defining RICs' roles and responsibilities. Doing so, should take into account not only RICs' location within regional ecosystems, but also specific activities entrusted to them. Four caveats should be in particular taken into account when designing RICs' roles and responsibilities:

- Firstly, the formal location of the RIC within the regional ecosystem. Depending on the region, the RIC may be formally located closer to the administration, which is the case in BBSK, or between the administration and intermediary organizations, which is the case in KSK.
- Secondly, the main priority of RIC should be to unite, coordinate and fill gaps in the existing support system operating in the region. When defining RIC's role, it is important to avoid situations in which RIC duplicates functions already available in the regional system or the responsibility for these functions should be clarified among stakeholders.

- Thirdly, it should be assumed that RIC's role will change over time as the local innovation ecosystem develops, which will be influenced primarily by the adopted RIC development strategy. If the RIC's strategy is to position itself as a coordinator and facilitator, then as the ecosystem develops, it should delegate more tasks to external institutions. If, in turn, the RIC's strategy is to be a central point for provision of support in the region, it may take over the roles of other institutions over time.
- Fourthly, taking by RIC the responsibility for specific activities requires the simultaneous clarification of its 'institutional role' during the activity implementation process. This issue was analyzed in more detail in Table 6 (section 10.1) of the CuR13 RD&I report, where three non-exclusive roles were indicated: (i) designer, (ii) implementer and (iii) facilitator, and where few examples were given.

5. POTENTIAL ACTIVITIES

During work on the CuR13 KSK RD&I component, bottlenecks and barriers slowing down the development of this region were identified. One of the deliverables of this work was a 'long list' of potential RIC activities that addressed identified bottlenecks and barriers of the regional knowledge transfer system. The list is presented in Table 5 of the CuR13 report. This list was then detailed in Table 6 of the report, which additionally proposed the expected results of individual activities, potential sources of their financing and the role that RIC should play in their implementation. The CuR13 report covered period 2021-2022 (i.e. much before the elaboration of the principles of the measure 1.1.1.), the conclusions and recommendations contained in this report are still valid and can be used to design activities for RICs, in particular with reference to activities that are to be financed through the measure 1.1.1.

This report understands the term 'activity' as a means to achieve planned objectives. For instance, development of individuals' skills related to innovation and entrepreneurship is an activity that a RIC can take. Activities can be financed from different sources, e.g. through various projects, and a single project can finance different activities. Activities are divided into tasks, whose delivery is to achieve envisaged goals.

The current CuR14 report focuses on providing examples of tested support instruments (activities) that encourage academia-business/public sector collaboration and shape innovative attitudes among individuals. They seem applicable to Slovak conditions and were selected through the prism of the feasibility of their implementation at the regional scale (and not so much at the national scale) and availability of their detailed designs. Some could be implemented by the regional level and some in collaboration with the national level. The presented set of examples provides basic information about key elements of each support instrument, such as goal, key financial aspects, eligible costs and stakeholders (including managing entity, beneficiaries etc.). Where possible, results of these programs are also provided.

Additionally, ideas about activities related to data gathering, monitoring and evaluation (M&E) are provided, since these will be crucial for keeping track of RICs' development. RICs are young and dynamic hence they will be testing various activities and approaches. Experimentation is encouraged by this report, however, it should be coupled with a robust M&E system that ensures gathering lessons, scaling up of well-functioning instruments, and phasing out or fine tuning the ones that do not deliver expected results.

5.1. "MICRO GRANT" PROGRAM

FIGURE 5: "Micro grant" program: design

Micro grants

Financial support for companies to buy research services from universities (2020-2023)

Goal: provide companies with fast financing for small R&D projects (PoCs) in cooperation with universities.

Soft goal: initiate lasting cooperation between scientists and entrepreneurs.

The scientists are involved in the preparation of the research agenda and are financed from the program. Conceptually, the program gives the scientist a tool to tell the entrepreneur, „If you outsource research to my university, I will finance 75% of the cost.“

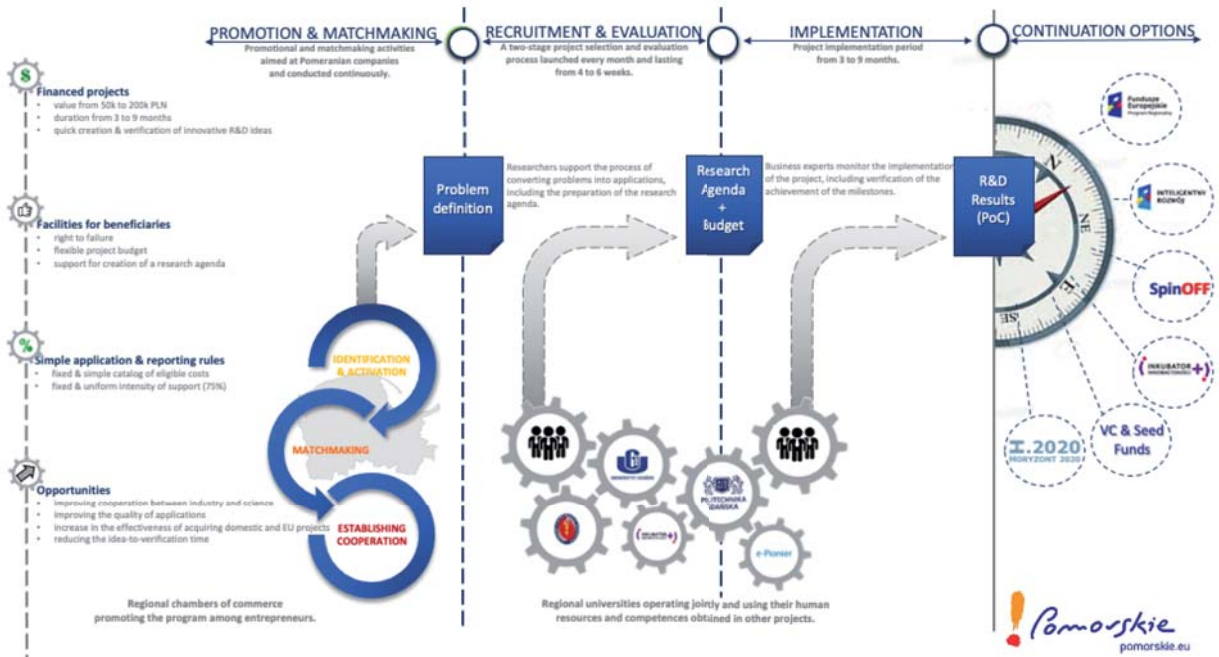
Finances:
Single project up to EUR 50k. Three-year budget EUR 4M, of which EUR 1M for running the project and the rest to support the companies.

Eligible costs:
Project running costs are 100% financed (e.g., salaries, promotion, offices, training, equipment).
The company, from the grant received, may purchase a research service at the university. The company's other costs are not financed. Financing is provided in the *de minimis* model.

Entities involved:
Companies: (i) receive a fast financing for R&D activities, (ii) receive support in preparation of research agendas and gain experience in applying for funds from national and European programs.
Universities: (i) provide experts supporting companies in the preparation of research agendas, (ii) provide professional research services to companies.
Researchers: (i) gain experience in cooperation with companies.
Chambers of Commerce: (i) provides business experts who evaluate applications and make decisions on granting funding, (ii) promote the program among companies.
The Marshals Office: (i) promotes the project in the region, (ii) helps companies to reach for funding from large national and European programs together with local universities.

Source: Authors, 2024.

FIGURE 6: Implementation mechanism of the "Micro grant" program



Source: Authors, 2024.

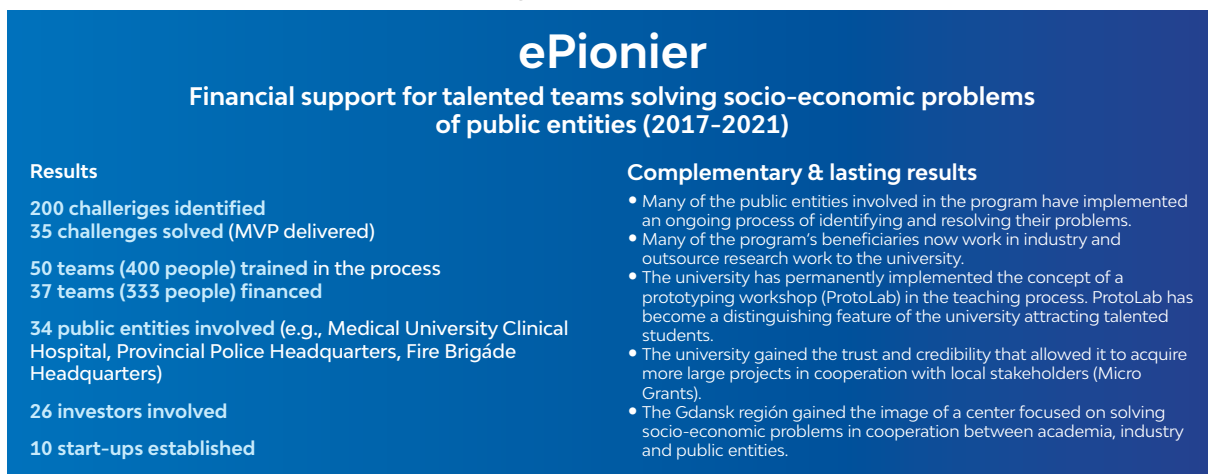
5.2. “ePIONIER” PROGRAM¹⁰

FIGURE 7: “ePionier” program: design



Source: Authors, 2024.

FIGURE 8: “ePionier” program: results



Source: Authors, 2024.

5.3. "PROTO LAB" PROGRAM

FIGURE 9: "Proto Lab" program: design

ProtoLab

Prototyping room for individuals and start-ups available 24/7 (2018-present)





Goal: create a space for experimentation for individuals and start-ups to help them develop their ideas and gain experience.

The ProtoLab is located partially at the university's campus and partially at the technology & science park.

Finances:
equipment, fittings & premises adapting budget EUR 100k.

Laboratories: (i) electronic circuit design laboratory, (ii) 3D printing laboratory, (iii) AI & ML laboratory, (iv) VR laboratory, (v) space technology laboratory and (vi) mechanical laboratory.

Entities involved:
Individuals: have access to comprehensive infrastructure allowing them to develop a wide range of their own projects. Universities: ProtoLab is part of experience-oriented learning. Entrepreneurs: have access to better and more mature employees. Technology parks: ProtoLab attracts start-ups to open offices in the parks.

<https://excentro.pl/e-pionier/protolab/>

Source: Authors, 2024.

5.4. "LIVING LAB" PROGRAM

FIGURE 10: "Living LAB" program: design

Living Lab (LL)

Collaborative research method for sensing, prototyping, validating complex solutions in multiple & evolve real-life contexts

GOAL

- Needs-demand based, flexible/ agile, user-centric innovation
- Co-production 4 knowledge-transfer driven
- Interdisciplinary user innovation via a network of user communities in design & testing process

EU Network (ENOLL): 140 LLs- 80% in 21/27 EU member states, +20% outside EU (Asia, Australia, South America)

2 examples: FISSAC (UK) - Thematically Specialised LL/ Pan-European Regional, AMS (NETH) - Network of Urban LLs in Amsterdam

FISSAC Fostering Industrial Symbiosis for a Sustainable Resource Intensive Industry across the Construction Value Chain

9 Thematic Regional Living Labs, 26 partners, 9 countries via regional projects FISSAC Circularity/ Zero Waste Models & Validation

Funding Source/ duration: Horizon 2020, 11.2 Million EUR, 80% EU /20% own financing (Sept. 2015 - Feb. 2020)

AMS
METROPOLITAN
SOLUTIONS

AMS est. 20M as multi-stakeholder **co-innovative space** for test, develop and create urban/ regional solutions.

6 urban challenges via collaborative **research** to create an innovative, sustainable, just city; stimulate innovation SMEs/ spin-offs, MSc Program, summer schools, trainings, spin-off LLs, digitalify

Partners Delft Uni of Technology, Wageningen Uni, MIT = expertise, network, interdisciplinary using City of Amsterdam as a LL

Partnerships via MoUs, collaborative projects & spin-offs multi-stakeholder co-creation universities, companies, cities & citizens



Responsible Urban Digitalization



Smart Urban Mobility



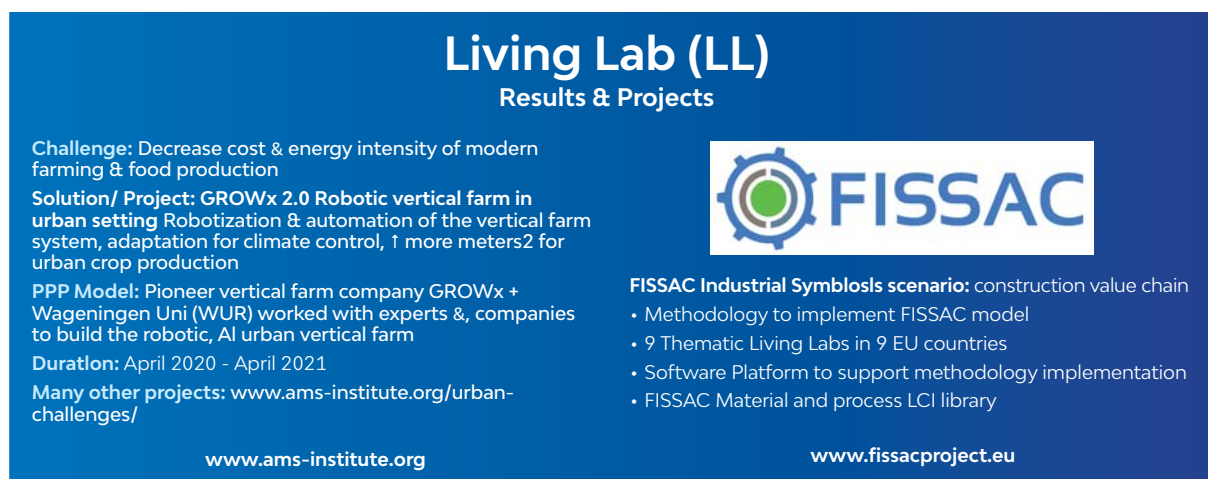
Metropolitan Food Systems



Urban Energy

Source: Authors, 2024.

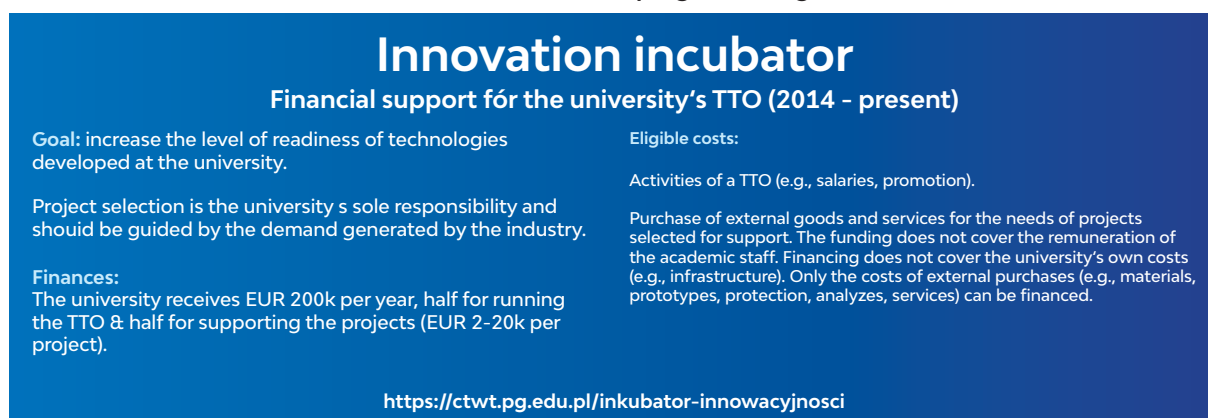
FIGURE 11: “Living LAB” program



Source: Authors, 2024.

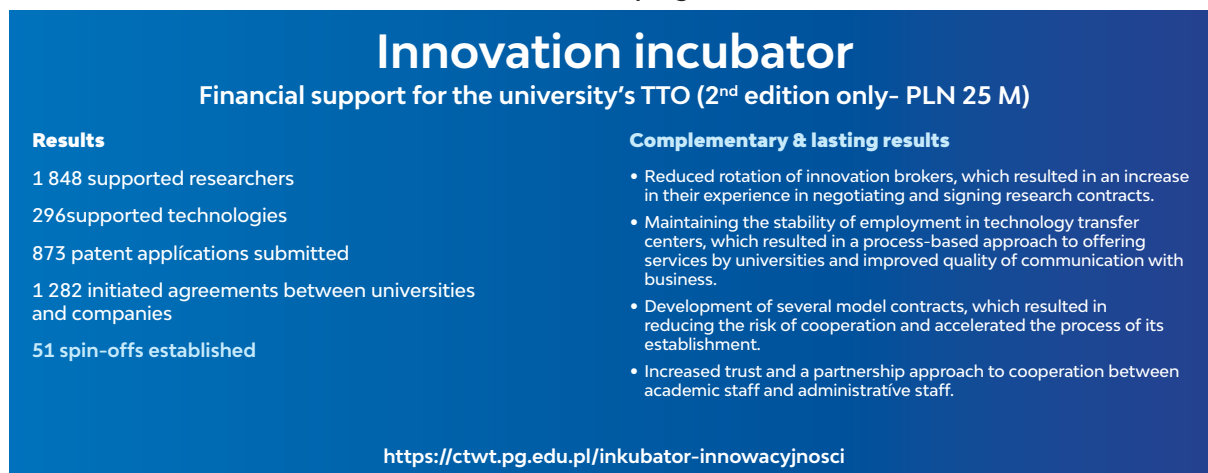
5.5. “INNOVATION INCUBATOR” PROGRAM

FIGURE 12: “Innovation Incubator” program: design



Source: Authors, 2024.

FIGURE 13: “Innovation Incubator” program: results



Source: Authors 2024.

5.6. "MOLANOTE" PROGRAM

FIGURE 14: "MOLANOTE" program: design

MOLANOTE

Commercial research infrastructure (2014 - present)

Goal: build research labs for the industry. Services are offered in the *de minimis* model.


The labs are owned by the Special Economic Zóne but are located at the university's campus and operated by the university staff. The Zóne is a formal seller while the cost of services is calculated by the university.

Part of the infrastructure capacity may be used by the university for research purposes free of charge.

Finances:
The value of the purchased infrastructure amounted to EUR 1.5M and was divided into six independent labs.

Eligible costs:
The labs was financed 100% due to the use of the *de minimis* model when offering research services.
The ongoing maintenance costs are financed from the revenues from the delivered research services.

Entities involved:
Special Economic Zone: (i) owner of the labs, (ii) formal service vendor. Unversltles: (i) operátor of the labs. Companles: (i) recipient of services at lower prices (*de minimis* model).



<https://molanote.gpnt.pl>

Source: Authors, 2024.

5.7. REGIONAL INNOVATION OBSERVATORY

BBSK and KSK are interested in gaining a better understanding of their regional innovation systems through the prism of regularly collected and analyzed data - for that reason the WB team recommends implementing the concept of a Regional Innovation Observatory (RIO). The primary objective of such observatories will be to systematically and transparently conceptualize, collect, analyze, store, visualize and interactively share regional innovation-related data with different user communities. The data user groups could include enterprises, investors, researchers, students, professional organizations (e.g. business associations), public administration, the general public and media. Such innovation observatories would generate public good in the sense of reliable and regularly published information about the innovation ecosystem, which currently does not exist in both BBSK and KSK. Besides monitoring the ecosystem development, RIOs could also oversee regular evaluations of implemented programs and instruments, however, conducting such evaluation studies should be outsourced to an independent party to avoid a conflict of interest. RIOs could be embedded in RICs as part of their core team and activities (see Section 8.2 for details) and could also support RICs in monitoring their own activities and targets.

Several streams of actions are possible under the RIO activity:

- **Conducting a baseline regional data mapping and establishing a baseline scenario should be one of the first steps in setting up the Regional Innovation Observatories.** In other words, assessing *who* within the region has *what* type of data, *what* this data says about the ecosystem, and *how* it is collected and published.
- **Pro-actively collaborating with the statistics office (national and regional) to ensure that the data and sample of entities used for data gathering for national and European statistics accurately describes the regional innovation ecosystem.** For instance, EU's Regional Innovation Scoreboard data is collected at the European level in collaboration with national statistics offices of the Member States. However, when the CuRI team tried to identify how specifically innovation-related information is gathered for the eastern Slovak Republic the process was not fully clear. Proper data gathering by statistics offices and their accurate submission

by regional entities (companies, research organizations) have a direct influence, how well a region is assessed at the European level. A better score at the innovation scoreboard index may translate into greater interest of potential investors and innovators. This exemplifies the importance of structured and systematic effort to gather and publish proper data and could become RICs' value added for all regional stakeholders.

6. MONITORING AND EVALUATION

Monitoring and evaluation (M&E) are the foundation of evidence-based policy that helps optimize functioning of institutions and programs. In the CuRI RD&I context, the M&E mostly pertains to two levels, RIC and regional innovation ecosystem. They are intertwined but separate and when discussing indicators, monitoring and evaluation this distinction should be clear. The objective of this report is to focus on RICs, hence an aspect of ecosystem M&E is only briefly discussed.

RICs are young and dynamic institutions thus systematic monitoring of their activities and measurement of performance will be key for their success and growth. Regular M&E enables keeping track of progress against initial plans and understanding what influences the innovation ecosystem, how and to what effect. Based on such diagnostics, actionable insights can be drawn for RICs' evidence-based planning, identification of problem areas, identification inefficiencies, and the fine-tuning of innovation support interventions or abandonment of approaches that simply do not work. Overall, robust metrics and their monitoring will enable RICs to perform better, but also communicate their results grounded in evidence. They would also help RICs prove their added value to their funders, partners and future investors.

The above also applies to Slovak regional innovation systems - they are young and currently starting to take shape, hence their close M&E is recommended to steer them in a good direction. The scope of M&E of an ecosystem is much broader than one of RIC. The ecosystem approach includes activities of a broad range of regional stakeholders that indeed include RIC, but also go much beyond. Usually, an ecosystem M&E approach is described in a regional innovation strategy that provides specific goals, indicators and targets as well as division of tasks between responsible actors. In both regional strategies M&E descriptions are quite short and provide only general guidance on key directions of ecosystem development. Their further specification during the upcoming updating process is advised.

These two layers of M&E overlap to some degree, because RIC's objectives are aligned with regional goals expressed in the regional strategy. It will be important though to keep these two mechanisms separate and conclusions from one should not be automatically used for the judgment of the other. It may happen that a well functioning RIC, i.e. one that achieves its own goals, will be underappreciated if a broader ecosystem does not function equally well (which could be caused by reasons beyond RIC's influence). Conversely a well functioning ecosystem may mask underperformance of a RIC.

Good practice in designing an M&E system is to define indicators at least three levels (input, output, outcome) and make them SMART. The latter relates to the fact that indicators should be specific, measurable, attributable, realistic and timebound to make them really useful. The utilization of three indicator levels is recommended for both RIC and the innovation ecosystem. While some indicators in these two M&E mechanisms will be distinct (because the ecosystem applies to other than RIC stakeholders), and some may be the same. For instance a number of startups will be a relevant indicator for both M&E mechanisms, though at a different indicator level. For RIC a number of startups may be an outcome indicator, while for the ecosystem it's more of an output indicator.

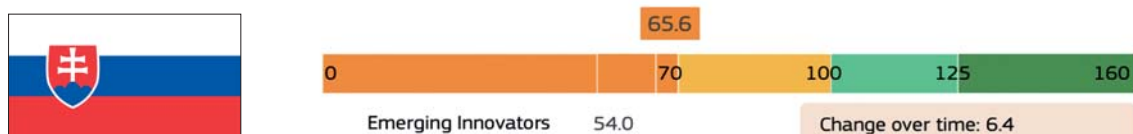
6.1. HOW TO CHOOSE RELEVANT INDICATORS FOR RICS?

When discussing suitable indicators for RICS within CuRI it turned out that selectiveness is the main challenge. It is easy to come up with a plethora of inputs, output and outcome indicators that pertain to the innovation field; it's more difficult though to identify indicators that are possible to measure and attributable to RIC's actions. CuRI partners agree that having too many indicators is counterproductive and a narrow selection reinforces RIC's mission and objectives. An important caveat in this discussion is that RICS' indicators will be different to indicators of other stakeholders and the innovation ecosystem as well. For instance, RIC's outcome-level indicator (e.g. number of created startups) may be an output-level indicator for the regional innovation ecosystem. These indicators are context specific, hence this report does not recommend a set of standard indicators.

The WB team recommends focusing RIC's indicators at four levels that pertain to its objectives and the specific Slovak context, namely: EU, national and regional innovation strategy, specific project, and selected RIC's priority. The selection of RICS' indicators along these four levels is advised because it simplifies RICS' reporting, reflects their value added to stakeholders at these different governance levels, and automatically shows RICS' alignment with key policies and financing sources attached to them.

At the European level the most well-known innovation indexes are the European Innovation Scoreboard and Regional Innovation Scoreboard. The former ranks country-level innovation systems based on 32 indicators grouped under 12 dimensions such as: attractive research systems, digitalization, innovators, firm investment in research and development, intellectual assets, and use of information technologies (Figure 15). The regional scoreboard follows a similar methodology and uses 21 indicators from the European Innovation Scoreboard but disaggregated to 239 regions across Europe at NUTS2 level (Figure 16, Figure 17). Slovakia is divided into four regions, and the Košice region is grouped with Prešov, while Banská Bystrica with Žilina.

FIGURE 15: European Innovation Scoreboard 2023: the Slovak Republic



Slovakia

	Performance relative to EU in 2023	Performance change 2016-2023	Performance change 2022-2023
SUMMARY INNOVATION INDEX	65.6	6.4	4.2
Human resources	91.6	1.7	21.3
Doctorate graduates	85.2	-45.8	0.0
Population with tertiary education	83.2	-2.4	-2.4
Lifelong learning	108.8	87.9	87.9
Attractive research systems	51.7	18.2	2.8
International scientific co-publications	62.5	32.3	-6.0
Most cited publications	39.8	11.8	3.8
Foreign doctorate students	62.3	19.6	8.5
Digitalisation	67.1	12.0	5.2
Broadband penetration	61.3	23.6	10.3
People with above basic overall digital skills	74.9	0.0	0.0
Finance and support	38.1	3.7	1.7
R&D expenditures in the public sector	45.3	-22.6	-1.6
Venture capital expenditures	35.5	16.0	-3.5
Government support for business R&D	33.0	26.9	11.6
Firm investments	56.0	16.5	0.3
R&D expenditure in the business sector	32.6	15.4	2.3
Non-R&D Innovation expenditures	99.6	16.7	-1.8
Innovation expenditures per employee	42.9	17.5	0.3
Use of information technologies	74.7	-9.7	-2.5
Enterprises providing ICT training	59.8	-19.7	-5.1
Employed ICT specialists	90.0	0.0	0.0
Innovators	42.3	15.6	14.2
Product innovators (SMEs)	42.9	16.0	0.5
Business process innovators (SMEs)	41.8	15.1	28.8
Linkages	49.8	10.7	-3.6
Innovative SMEs collaborating with others	59.1	-11.3	-8.8
Public-private co-publications	80.5	39.0	-7.2
Job-to-job mobility of HRST	29.2	17.6	2.9
Intellectual assets	49.4	7.0	-1.7
PCT patent applications	33.1	3.3	-0.7
Trademark applications	82.4	26.2	4.2
Design applications	37.2	-3.4	-7.5
Employment impacts	55.9	11.7	9.6
Employment in knowledge-intensive activities	68.7	0.0	0.0
Employment in innovative enterprises	45.4	22.8	18.6
Sales impacts	101.8	0.4	11.5
Medium and high-tech goods exports	119.9	8.5	6.4
Knowledge-intensive services exports	65.1	20.1	0.8
Sales of innovative products	114.5	-36.6	32.7
Environmental sustainability	95.5	-2.8	-5.7
Resource productivity	75.8	17.4	5.7
Air emissions by fine particulate matter	107.6	21.9	0.2
Environment-related technologies	97.6	-45.4	-20.3

The second column shows performance relative to that of the EU in 2023. Colours next to the column show matching colour codes: dark green: above 125% of the performance of the

SLOVAKIA is an **Emerging Innovator** with performance at 65.6% of the EU average. Performance is above the average of the Emerging Innovators. Performance is increasing at a rate lower than that of the EU (8.5% points). The country's performance gap to the EU is becoming larger.

Relative strengths

- Medium and high-tech goods exports
- Sales of innovative products
- Lifelong learning
- Air emissions by fine particulate matter
- Non-R&D Innovation expenditures

Relative weaknesses

- Job-to-job mobility of HRST
- R&D expenditure in the business sector
- Government support for business R&D
- PCT patent applications
- Venture capital expenditures

Strong increases since 2016

- Lifelong learning
- Public-private co-publications
- International scientific co-publications

Strong decreases since 2016

- Doctorate graduates
- Environment-related technologies
- Sales of innovative products

Strong increases since 2022

- Lifelong learning
- Sales of innovative products
- Business process innovators

Strong decreases since 2022

- Environment-related technologies
- Innovative SMEs collaborating with others
- Design applications

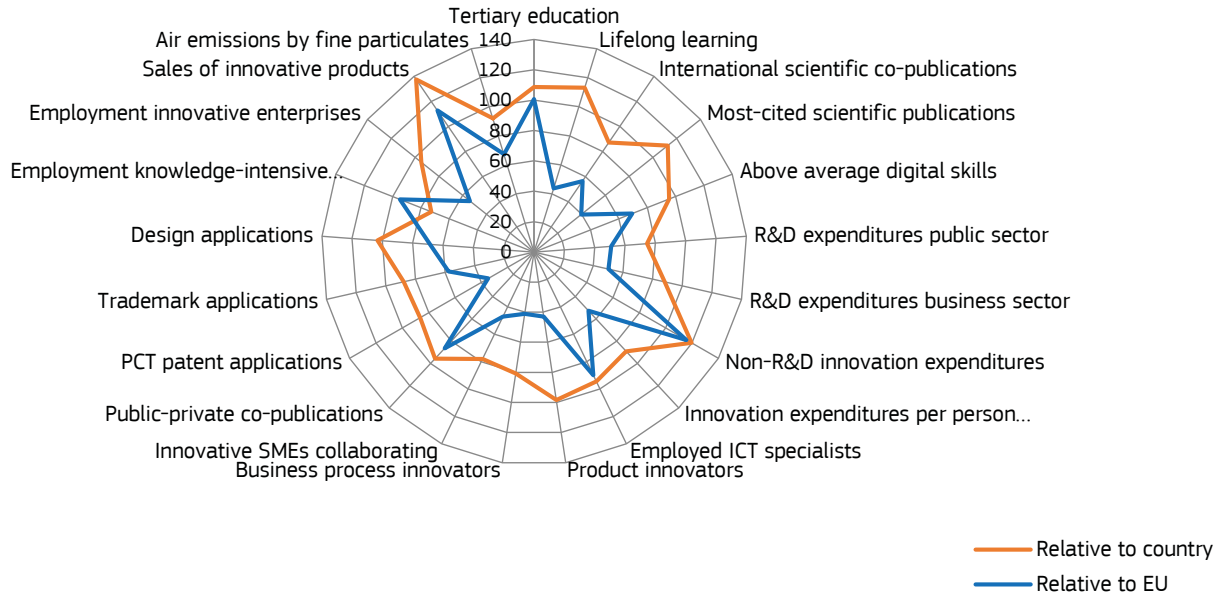
Source: European Innovation Scoreboard, https://ec.europa.eu/assets/rtd/eis/2023/ec_rtd_eis-country-profile-sk.pdf

With regard to EU level indicators, RIC's objective is to advance region's position at the **Regional Innovation Scoreboard**. Thus RICs are advised to align their indicators with these scoreboard indicators they can influence to the highest degree - most likely this will be a level of RICs' outcome (strategic) indicators. The following indicators seem good candidates: product innovators, business process innovators, employment knowledge-intensive, employment innovative enterprises, sales of innovative products, lifelong learning, R&D expenditures business sector (Figure 16). RICs should not aim at too many and it's recommendable to stay selective.

National and regional innovation strategies are guiding documents for regional innovation ecosystems and their stakeholders. It is assumed that regional documents reflect national priorities and translate national objectives into regional ones. Hence RICs should also be able to demonstrate

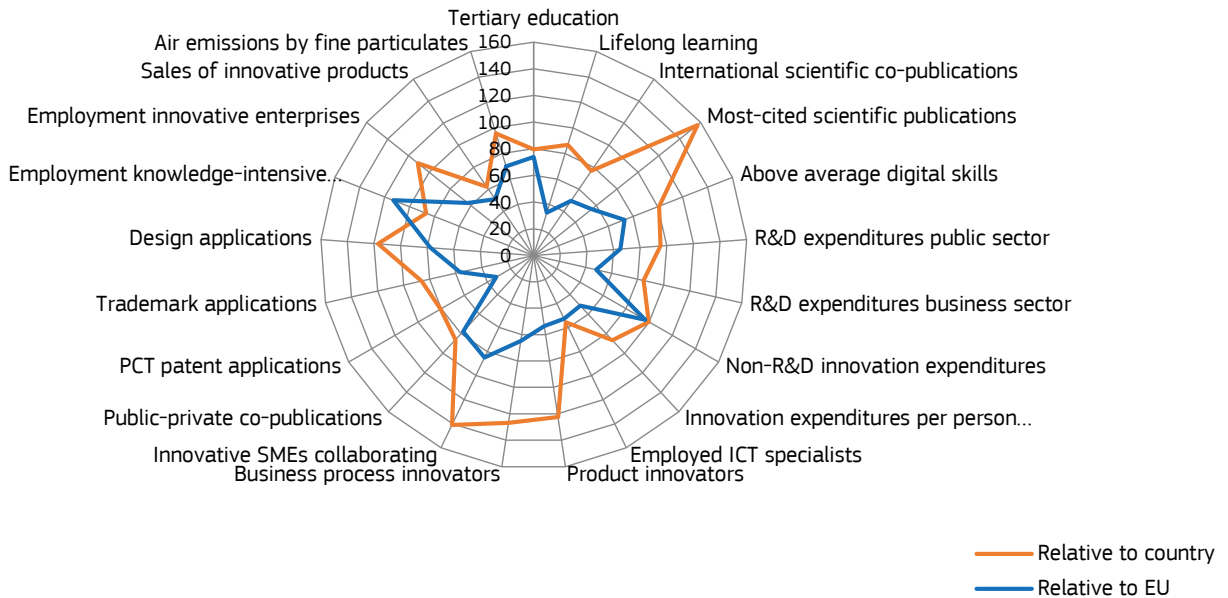
how their activities help achieve specific goals (and indicators) of these strategies. As with the EU level indicators, RICs should not aim at addressing all regional indicators, but these ones where they have most to contribute, and which align with RICs' mission and vision. These indicators could be reflected either at RICs' outcome or output level.

FIGURE 16: European Regional Innovation Scoreboard 2023: Eastern Slovakia (including KSK)



Source: Regional Innovation Scoreboard 2023, https://ec.europa.eu/assets/rtd/ris/2023/ec_rtd_ris-regional-profiles-slovakia.pdf

FIGURE 17: European Regional Innovation Scoreboard 2023: Central Slovakia (including BBSK)



Source: Regional Innovation Scoreboard 2023, https://ec.europa.eu/assets/rtd/ris/2023/ec_rtd_ris-regional-profiles-slovakia.pdf

The project level mainly refers to the measure 1.1.1. of Program Slovakia, since it will be an important source of RICs' financing. RICs could select indicators that allow monitoring and reporting their results and performance that are aligned with the measure 1.1.1 level expectations. Depending on the granularity of these 1.1.1. indicators they could be monitored at RICs' either output or outcome level.

The fourth area pertains to idiosyncratic RICs' objectives, since every region is unique and has its own specific needs. In such areas, RICs should have freedom to indicate these specific priorities through the set of indicators. Depending on the scale of these specific needs they could appear at any level of RICs' indicators.

Indicators used by RICs will depend on their individual goals, regional context and priorities of their stakeholders. A one size fits all approach does not work here. A sample of potential indicators for RICs consideration is proposed in Table 2. This selection is based on discussions with the CuRI team. In some cases, the CuRI team had diverse opinions on assigning these indicators to output and outcome categories as well as exact formulation of what an indicator should measure and how. These discussions will be needed in every RIC and help align the RIC model to local expectations. This sample is provided as an inspiration and stimulation to the discussion.

TABLE 2: Sample of potential RIC indicators

RIC's strategic goal	Number of annually established companies in the region Number of knowledge intensive jobs created Share of STEM employees in the regional companies Advancement of region's position in the Regional Innovation Scoreboard (on targeted indicators)
TALENT	
Output	500+ individuals enrolled in early bird entrepreneurship programs annually 25+ presented prototypes/ideas annually 300+ project ideas in the RIC's database XXX teachers trained in innovation topics XXX course curricula adjusted to promote entrepreneurship and innovation Number of teams supported by RIC programs Number of teams incubated by RIC Creation of a database of mentors for individuals New innovation and entrepreneurship curriculum introduced in regional schools and universities
Outcome	Share of secondary school students choosing to study in the region Share of youth considering starting own company as a viable career path
ENTERPRISES	
Output	Number of newly established companies after RIC's acceleration/incubation support by the end of 2026 50+ SMEs supported by RIC at the end of the 2026 15+ externally funded projects won and implemented or under the implementation Number of project application elaborated with/for SMEs Amount of investments in local startups Collaboration with at least one renowned acceleration programs by the end of 2026 Value of grants for innovative activities distributed to regional companies and institutions
Outcome	Number of product/process innovations implemented in companies Number of new companies established in the region increased by XXX % YoY Number of jobs created Regional avg salary against the national avg Dynamics of the revenue of supported companies against the regional average Share of established companies (with RIC's support) that survived more than 2 yrs compared to the regional/national survival rate Volume of VC raised by startups (disaggregated by gender)
R&D COLLABORATION AND KNOWLEDGE TRANSFER	
Output	10+ new early bird research teams annually 5+ new university-industry partnerships/projects formed annually 5+ awareness raising events annually 3+ spin-off supported annually

Outcome	Number of faculties/relevant entities commercially using R&D infrastructure Number of knowledge intensive jobs created (disaggregated by types) Amount of money invested in R&D projects / activities by companies increased by XXX % YoY Number of R&D based innovations implemented in local companies increased by XXX YoY Number of joint projects (e.g. contract research) increased by XXX % YoY Number of university-industry co-publications
----------------	---

GOVERNANCE, REPORTING, ECOSYSTEM

Output	Number of conducted regional innovation-related surveys Number of published regional innovation reports Number of memberships in international networks Value of joint innovation-related projects
Outcome	Public perceptions of innovation as an economic driver Number of non-RIC-initiated RD&I collaborations in the region Decrease in the rate of regional stakeholders indicating trust as a main bottleneck to innovation Number of regional stakeholders actively involved in ecosystem activities

Source: Authors, 2024.

6.2. DATA MANAGEMENT

Developing data management and performance monitoring frameworks is essential. This ensures that a clear plan is set in place about what questions, problems, objectives - related to the regional innovation ecosystems - need to be answered. Key aspects to be considered here are presented below. Ideally answers to these questions would be produced through an inclusive dialogue with regional stakeholders. The preparation of a robust data and M&E framework is an iterative process that paves the way for inviting relevant stakeholders to the discussion (Box 2).

- *What kind of data will need to be collected - by RIC and by the regional ecosystem as a whole?*
- *What SMART indicators are needed to measure the intended goals & objectives?*
- *How will the data be collected to track the selected indicators?*
- *How will data be analyzed?*
- *Where and how will the data be stored and secured, and who will have access?*
- *How will the data be shared and disseminated to different audiences (e.g. external and internal stakeholders), if different, and*
- *Who within the innovation ecosystem will be responsible for what inputs in the data collection-analysis-monitoring-sharing value chain?*

BOX 2: Setting up a robust M&E framework

Step 1: Identify RIC's Vision, Goals and Strategic Objectives.

Step 2: Define Indicators at Every Level. These should be logically linked and create an outline showing how lower level inputs and outputs contribute to higher level goals and ultimately to outcomes and impact.

Step 3: Define Timeline and Set Realistic Targets at output-outcome-impact level.

Step 4: Identify Data Collection Methods, Systems and their Frequency.

Step 5: Develop a Monitoring and Evaluation Plan, including budget and means of analysis and dissemination of results.

Step 6: Determine M&E Roles and Responsibilities in the data collection-analysis-dissemination value chain by leveraging well functioning systems that may already be in place.

Step 7: Implement M&E Framework and Share Analytical Results. Conduct envisaged activities in collaboration with the stakeholders.

Step 8: Fine tune M&E Framework. In collaboration with other system stakeholders regularly monitor and assess the M&E framework functioning to further enhance its accuracy and robustness.

Source: Authors, 2024.

M&E data alone is not useful until it is put to meaningful use. To close the data governance full circle, RICs should decide how they want to share the data and with whom. This step should not be sidelined as it is key to effective data sharing and its ultimate usage within an innovation

ecosystem. Data sharing is the process of making the data resources available to multiple users, or organizations. It includes technologies, practices, legal frameworks, and cultural elements that facilitate secure data access for multiple entities without compromising data integrity. Data sharing will improve efficiency within RICs and foster collaboration with other partners within an ecosystem. Cultivating good relationships with data user communities to incentivize proactive data usage is equally important. In the case of RICs and other entities within innovation ecosystems, data sharing can be done in several ways:

1. Data sharing agreements and protocols. Data sharing agreements set out the purpose of the data sharing, cover what happens to the data at each stage, set standards and help all the parties involved in sharing to be clear about their roles and responsibilities. Having a data sharing agreement in place will also help RICs' Data Observatories to demonstrate that they are meeting their accountability obligations under the GDPR.
2. Application programming interfaces (APIs) are mechanisms that allow IT systems to communicate with each other using a set of definitions and protocols. The interface can be thought of as a contract of service between two organizations' applications. This contract defines how the two communicate using requests and responses. Data sharing APIs support fine-grain access controls and specify exactly what data consumers can request and how.
3. Public visualization. Data sharing within Data Observatories or platforms can be also done via already processed and visualized data. This can come in the form of interactive filters that can enable external users to manipulate data, or it can come in the form of predefined visualization (charts, plots, infographics, or animations). In general data visualization is a strategic skill that could help RICs promote their activities, regional innovators and regions themselves.

The Slovakia CuRI program supported setting up units in two regional administrations devoted to geographic information system (GIS) and they developed skills related to data management and visualization. The CuRI GIS component was active in Košice and Presov regions and these both GIS teams are a valuable source of knowledge about automatization of data processing, storing, sharing and visualization. Collaboration between the RD&I and GIS team is thus recommendable.

7. SEQUENCING OF RIC DEVELOPMENT

Development of an innovation ecosystem is a long-term game, and could be compared to building a tall building, every floor being another level of ecosystem development. To build a strong and sustainable innovation ecosystem, it is not possible to take shortcuts and ignore or skip some development stages, especially those leading to building the foundations of its functioning. For example, ensuring a constant inflow of high-quality technologies or ideas that have a chance of turning into local start-ups with the potential to attract international investors (which are higher floors of the innovation ecosystem) requires first building a critical mass (pool) of talents and teams capable of creating and initiating innovations (ideas). A constant supply of highly qualified staff is a prerequisite for attracting investments of global players to the region and facilitating growth of local companies, since they are companies' potential employees. At further stages instruments for supporting startups are crucial as well as an open and supporting business environment framework. Ideally, physical infrastructure and amenities would complement other features by providing high quality of life and attractive living conditions for talent and investors.

Innovation ecosystems, especially ones at the early stage of development tend to be dynamic. The assumption of the CuRI team is that RICs will become key players in coordinating and facilitating the development of regional innovation ecosystems, while system stakeholders will be responsible for excelling in their key roles in the ecosystem. The CuRI RD&I team proposes to concentrate RICs' activities around four key pillars, since these pertain to key features of a well-functioning innovation ecosystem. The importance of these pillars is expected to remain unchanged in the long term, however, the allocation of resources between them, specific activities, their importance for the development of the ecosystem as a whole, as well as the intensity and scope of undertaken interventions will evolve over time.

Investing into RD&I ecosystem development is very different from investing into individual R&D projects. Both these activities are complementary and needed, but skills, political support, and timeframe they require are of different scale. Nurturing the system is a process set for a long term, a key feature here is ensuring system's sustainability. This process encompasses a broad spectrum of actors, and stakeholder inclusion and interaction constitute important features. Its goals are also much more diversified, though this doesn't mean they cannot be specific. On the other hand, supporting an R&D project is time bound and pertains to a (relatively narrow) group of actors that focus on a specific outcome (regardless of whether this is basics or applied research). It may happen that innovation system development is focused mainly on soft activities (coordination, events, data gathering, analyzes, service provision) and with limited infrastructure investments, while R&D projects may be R&D infrastructure intensive. Hence funding earmarked for the former does not need to be very high. Again, both aspects are needed for ecosystem's functioning, however, they are not the same and their funding sources are different.

The proper sequencing of RIC development and its support offer is pivotal to ensure its maximum effectiveness and efficiency. RICs start as small entities made usually of less than six people and with a limited portfolio of tasks. As the regional innovation ecosystem develops, RICs will need more resources to meet the growing demand generated by its beneficiaries and system stakeholders. The latter will become better prepared to absorb support and use existing opportunities and RICs will have enhanced capacity to engage in more activities.

Currently, RICs are at the stage of planning their next years of functioning as they are preparing for applying to the measure 1.1.1. of the Program Slovakia, which is expected to be their main source of funding over the next four years, i.e. till end 2027. Though details of the measure 1.1.1. are not yet known, it is clear that RICs will be expected to present their development paths and goals they aim to achieve during that period. For young institutions that just start their operation in a thematic area where the regional level has limited experience, such mid-term planning poses many question marks because RICs and regions lack reference points.

In a situation when it is difficult to determine in advance both the demand and the effectiveness of the planned activities, the Bank team recommends using a four-stage approach: (i) identify, (ii) design, (iii) test, (iv) scale up. This approach should enable RICs' core team to maintain focus on key activities with the greatest development potential for the region. It should also ensure that the finances and resources at RIC's disposal are used for activities with the highest effect to cost ratio in relation to the objectives and goals set for RIC. Introducing a testing phase before scaling the project should prevent situations in which significant funds are allocated to projects that do not bring the expected results. BBSK and KSK are already partly using the recommended approach for designing their regional start-up incubation and acceleration ecosystem.

7.1. SUPPORT ACTIVITIES FOR INDIVIDUALS AND STARTUPS

An illustration of the dependencies in a mature start-up ecosystem, with a particular emphasis on its dynamics over time, is presented in Figure 18. It was prepared based on the analysis of the Silicon Valley and in many respects, it is not possible to be directly implemented in the Slovak reality, but the dependencies shown in it are of a general nature and it is worth taking them into account when designing regional innovation ecosystems and RICs' activities in a longer time horizon.

Firstly, the figure highlights the importance of building a pool of talents and the necessary competences and experience from which, thanks to cooperation and networking, teams can emerge that create and implement ideas that constitute the seeds of projects and future companies.

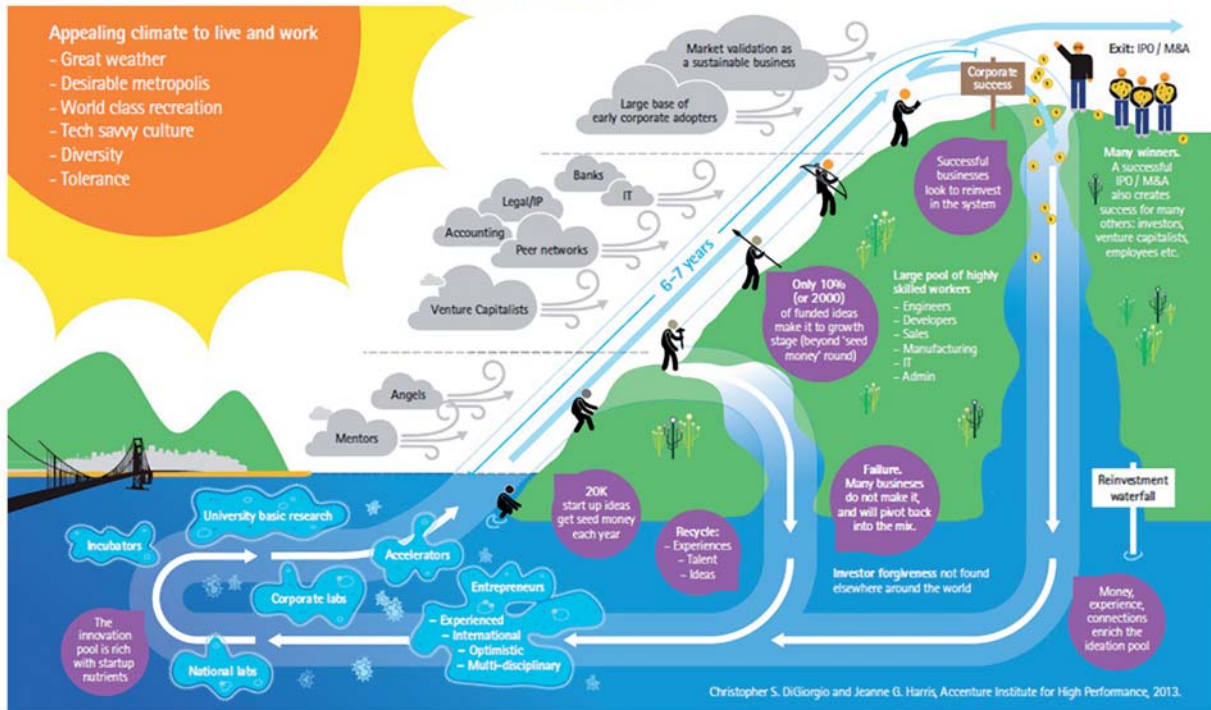
The figure also shows the path these teams (talent, which at some point is institutionalized as a company) must take from idea to success and how they should be supported by various types of mentors, business angels and investors at subsequent stages of development. It draws attention to the cyclical nature of the processes taking place in a mature startup ecosystem, where at many stages, both in the case of success and failure, people and their competences return to the pool, feeding and strengthening it. Ultimately, after achieving success, mature entrepreneurs become mentors and/or business angels, educating and funding subsequent generations of young entrepreneurs.

Building the ecosystem presented in the figure takes years. The abundance and quality of the pool of talents and competences is the basis of a mature ecosystem supporting innovation and is also a key element that cannot be outsourced. Secondly, when the pool is growing, building local groups of mentors and angels becomes important, which are necessary to support startups at the initial stages of their development. Starting from the VC level, the ecosystem can rely on organizations operating globally, which will be more interested in being present locally the more valuable projects are generated.

FIGURE 18: Elements on innovation ecosystem (Silicon Valley)

Silicon Valley Tech Innovation Ecosystem

Silicon Valley's greatest innovation – how companies evolve from ideas to successful enterprises



Source: Decoding the contradictory culture of Silicon Valley, Accenture Institute for High Performance, 2013.

Both KSK and BBSK plan to invest in the development of a start-up ecosystem as part of the regional innovation landscape. The key to the success of such a project is to ensure a substantial stream of high-quality teams (skilled individuals) and ideas (business projects), in order to generate constant interest from investors, starting from regional business angels to the largest and best VCs in Europe. Business angels, who usually are experienced and wealthy individuals, can be both the source of pre-seed capital as well as mentors for the younger generation of entrepreneurs. VCs can be responsible for organizing high-quality incubation and acceleration programs, which for emerging ecosystems are even more important than the provision of financing of subsequent investment rounds.

KSK is advanced in these activities, having successfully launched activities such as “Founders’ Challenge”, “Startup Campus” and “Startup Factory”¹¹. BBSK also supports its ecosystem by organizing “Innovation meetups” for entrepreneurs and ROs, as well as other thematic events with workshops, such as “Hackathon i-Days”: a student competition aimed at tackling health challenges. These events also help RIC approximate the region’s potential in terms of both the number of teams prepared to compete for financing internationally, and the quality and maturity level of their projects (ideas).

Sequencing support in this area is particularly important and RICs are advised to initially prioritize skill development (talent) over idea development. While both elements are needed in the ecosystem, the sequencing is important for quickly achieving the ability to generate high-quality ideas in the ecosystem. Investing in the preparation of teams (talent pool of skilled individuals) results in the creation of an increasing number of good ideas (idea pool), which in turn has a chance of attracting the interest of early investors and subsequently best VCs (Figure 19). RICs naturally should support both processes, however prioritization of their resources is important and it’s recommended to dedicate more of them to skill development.

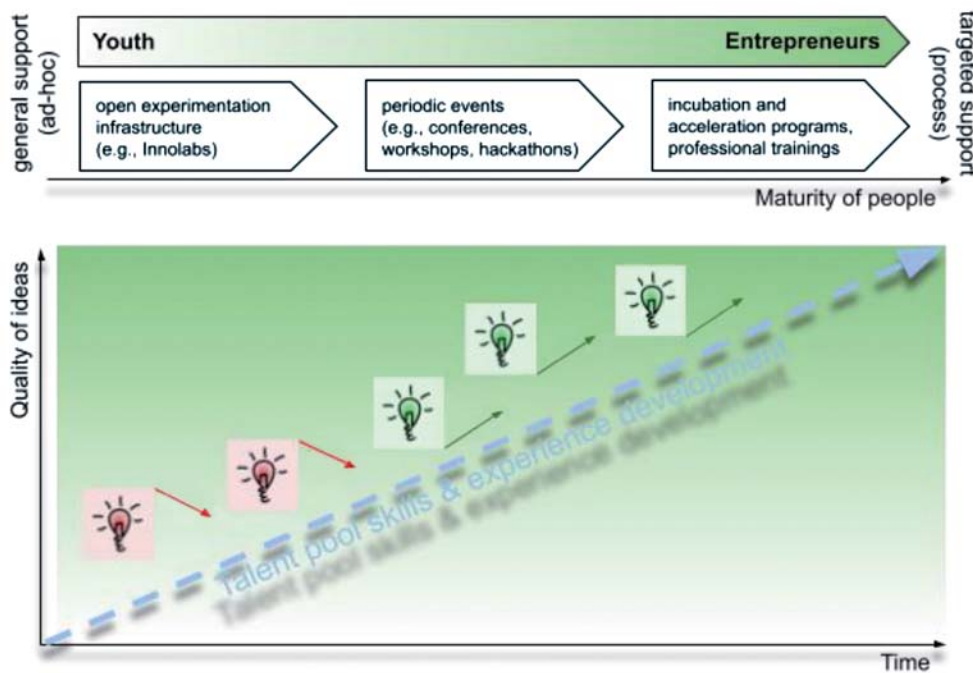
Investing in ideas is different from encouraging young innovators to start a company with the first idea they have. In fact, setting up a company should be one of the final steps in the process of developing the idea, because a formal company generates costs and legal obligations that young entrepreneurs are not always aware of and which they cannot easily handle. Setting up a company before the idea is crystallized can harm its development. Hence, premature financial support for ideas that are not prepared at a level that satisfies VCs interest may reduce the effectiveness of spending the funds available to RIC's own seed investments.

The figure below indicates that in the initial phase of the innovation ecosystem development, when the pool is shallow, and experience and competences of individuals are nascent, one should not expect the emergence of high quality ideas that could turn into startups with high survival potential. At this stage of the ecosystem development, most resources (i.e., time and funds) invested in supporting these ideas should not be treated as an investment that is to bring financial returns. They should be rather treated as a much-needed stage of ecosystem development and necessary investment in expanding and deepening the regional talent pool. It is expected that at this early (pre-seed) stage of idea development and in the context of an emerging regional innovation ecosystem, this will be RIC that invests much of these resources into developing ideas. Other investors could also contribute, but RIC is likely to lead the way. These initial investments are not expected to have a short-term positive impact on RIC's financial sustainability.

In the mid- and long-term, as the quality of the talent pool increases, high quality ideas will start emerging, which will result in enhancing the rate of establishing promising startups, with higher survivability potential. These startups will eventually become the foundation of an innovation critical mass, both in terms of the talent pool and investments. Thanks to growing more mature startups their owners and employees will gain new skills and competences and therefore the talent pool will expand and deepen. At the same time, with more successful exits, individuals will be able to take the role of business angels and investors supporting local talent. Successful exits will also attract a larger number of investment funds. Hence the financial sustainability of the ecosystem will be reinforced.

The upper part of the figure refers to the type of support needed at different stages of the development of talents and their ideas. It shows how to encourage young people to invest in their own ideas and how to then select and support ideas and teams with the greatest potential for success.

FIGURE 19: Recommended sequencing of startup ecosystem development



Source: Authors, 2024.

7.2. SUPPORT ACTIVITIES FOR COMPANIES

This section proposes the sequencing of RICs' innovation support to mature companies in the region with an emphasis on SMEs.

RICs will need to balance their attention between startups and mature companies. While the former are often perceived as an epitome of innovation, the latter tend to be an engine of regional growth and a main job creator. Startups have different definitions, in this report they are understood as young technology-based companies (younger than five years) with a scale up potential. Startups tend to be small, dynamic, not well endowed with funds and assets, and - due to their short history - tend to face difficulties with obtaining loans necessary for their further development. On the other hand, mature companies usually have a more stable financial situation and can more easily finance innovative activities, because they have brand, credit history and own funds, they also tend to hire more people. For that reason, mature companies are the foundation of economic activity and stable growth of a region. Hence, it is an important strategic question for RICs and their members, how much attention RICs should pay to supporting mature companies, especially SMEs, and how much of their scarce resources they should devote to supporting startups.

Mature companies are diverse and their needs differ. Such companies have different structure, history, staffing, organization culture, level of development on various aspects (e.g. digitization, process mapping, vocational training), they operate in different markets and have different goals. Provision of the high quality advisory on all these different aspects from the get-go is not feasible for any institutions and RICs should also not attempt that. For that reason, proper sequencing of development of RICs' skillset and advisory is crucial.

RICs are new entrants to the regional ecosystems and they still have to establish a strong brand and earn trust from stakeholders to learn about their needs to be able to design accurate support instruments. Because of RICs' early stage of development their set of competences and knowledge of the ecosystem will likely be limited and they will not have an in-depth understanding of strengths and challenges of individual companies or other stakeholders. This knowledge comes with time because entrepreneurs are usually cautious about discussing their needs, plans and/or challenges and they open towards individuals whom they trust. The latter can be developed through reaching out to companies, implementing various types of activities that involve them, and thanks to them RICs will develop direct contacts and get to know their counterparts.

It is difficult to guess in advance, which activities implemented by RIC will resonate the most with the regional stakeholders. For that reason, a two-prong approach is recommended here. First, conducting a limited number of targeted surveys (to avoid survey fatigue) could be useful to better understand entrepreneurs' viewpoints. However, one needs to keep in mind that declarations expressed 'on paper' are not always fully reliable. Second, this report recommends adopting an agile approach that focuses on designing and piloting schemes at limited scale, and then fine tuning and scaling them up if they turn out positive. In the nutshell, in the mid-term, RICs should aim at developing a broad network of companies that are willing to openly share their needs to allow RICs' fine tuning of their offer.

To establish a stable network of mature companies as clients and partners, RICs will need to generate added value that is appreciated by these enterprises. Provision of high quality support is one of key activities to achieve that. Here RICs need to develop a good understanding of the existing market and services that are already offered with the high quality, to avoid duplicating efforts and wasting its resources. On the other hand, initially RICs will have limited inhouse capacity to deliver high quality services, that is why, it's recommended they start with 'easier' services and expand their offer to more complex ones with time.

Regular provision of reliable information about the innovation ecosystem could be the first area developed by RICs. This is a 'simple' area that mostly bases on desk research and developing a network of contacts at the national and regional level. Usually, valuable information pertains to available

sources of financing, open calls for applications, entities looking for project partners etc. However, equally valuable could also be regular provision of data about the state of affairs of the regional innovation ecosystem, since this raises stakeholder awareness and contributes to a level playing field.

Another area that is highly appreciated and does not require massive resources is organization of regular networking among regional stakeholders. Often it happens that enterprises simply do not know each other. SMEs tend to be busy with managing their business and do not have resources or energy to reach out to unknown actors. RICs could become a convener or supporter of such meetings. Depending on available resources, this could include organization of study visits and travels to trade fairs. One of specific areas for such networking is collaboration of enterprises with research organizations. Previous CuRI RD&I reports documented that companies in BBSK and KSK rely mostly on personal connection to academia and have limited reach out to researchers. Creation of opportunities to expand these connections could be one of the RICs' tasks in the area of knowledge transfer.

These two areas could help RICs in establishing their initial network of partners, who, in turn, could provide feedback about their needs and challenges. Based on that and more desk-based research and regional surveys, RICs could develop further support activities that will be based on verified specific needs. Particularly three sets of topics could be relevant here, trainings (knowledge), access to finance, and provision of finance (small grants).

Knowledge activities could start with training delivery to groups of mature enterprises. On the one hand this would contribute to networking among enterprises, and on the other hand it would allow RICs' developing database of tested trainers and potential mentors. Provision of group trainings is advised for start, because it's easier and less intensive than devising a targeted solution for a single company. Moreover, this kind of upskilling seems to be allowed by the draft description of the measure 1.1.1. Specific topics of such group training sessions will depend on entrepreneurs' needs, however, there are some fields that seem universally relevant, for instance: application for innovation projects, twin transition (green and digital), innovation-oriented trainings for company management, company's process optimization, entering new markets, continuous development of staff competence, soft skills, collaboration with academia.

Companies, especially SMEs and young ones that do not have a stable financial situation or a long track record, often experience difficulties in financing innovation-related activities through external sources. That is why it is important to increase their ability to obtain external funds, including in the form of non-repayable grants or soft loans that lower the risk of engaging in innovative activities. It is essential to support SMEs to identify and access different sources of financing such as grants, loans, venture capital, business angels and crowdfunding. Provide advice on the preparation of business plans and presentations of projects or ideas (pitches) for financial institutions. RICs could offer advisory supporting companies in applying for funds or preparing them for negotiations with potential investors.

Provision of small innovation grants (vouchers) seems also a good tool to stimulate collaboration between companies and academia and can enlarge RICs' contact network. BBSK's experience with designing and piloting regional innovation vouchers that was delivered in collaboration with SIEA is a good example. This instrument helped the regional administration get to know local entrepreneurs and put companies in touch with the BBSK team.

RICs' provision of more advanced services oriented toward RD&I collaboration and knowledge transfer will depend on technology transfer centers (TTCs) operating in a region. Universities usually operate their own TTCs that could be responsible for mapping universities' resources that are suitable for commercialization and reaching out to enterprises. TTCs could also provide assistance to researchers and companies related to licenses and intellectual property right transfers (valuation, checking patents, draft agreements etc.). Depending on TTCs' scope of work, RICs could support the knowledge transfer area by offering support instruments targeted at research teams

(see examples in Chapter 5). Additionally, jointly with TTCs, RICs could organize events informing both academia and entrepreneurs about possibility of commercial utilization of R&D infrastructure, which is not yet common in Slovakia, as presented in CuRI RD&I 2 and 3 reports.

The third, and most demanding, set of advisory services could encompass audits, trainings and advisory dedicated to individual companies. Such activities require highly specialized knowledge and high quality experts that have profound understanding of a specific sector in which a given company operates. This kind of advisory tends to be longer and more in-depth and could lead to a broad range of outcomes. For instance, preparing a company's strategy of digital transformation, a feasibility study of entering a new market, designing the optimization of company's processes, establishing R&D collaboration with a specific research organization. RICs would most likely use external consultants for provision of such services. In the current draft shape of the measure 1.1.1., individual advisory is not an eligible activity, hence RICs would need to identify other funding envelopes to finance such activities.

As a next step, RICs could consider developing a center of excellence specializing in a specific domain. The thematic specialization that focuses on region's strengths and priorities does not need to be limited to a single topic, however, it should not be too broad. It would require gathering and maintaining a dedicated in-house team with high quality skills, a network of external experts, and a stable group of regional partners in business, academia and business support. Possibly, such specialization would lead to adopting a living lab approach to nurturing the collaboration. Since such a level of collaboration requires multi-stakeholder collaboration and trust it is likely to develop at the later stage.

8. RIC STRUCTURE

8.1. FORMAL STRUCTURE

RIC's institutional and legal structure will determine how the center will achieve its goals with the financial and human resources at its disposal. The effectiveness of how RIC will conceive and delegate roles, assign responsibilities, job functions, accountability and decision-making structures and processes will ultimately contribute to its success. Yet before developing a RIC's internal organizational structure, its legal status needs to be determined by its members. It is the legal status that will heavily influence RIC's range of possible functions, its membership and activities.

Under Slovak law, there are two main options of legal status that a RIC can take. In principle, RICs could choose to become a *for-profit* or a *non-profit* legal entity. During the previous CuRI editions, the regional and WB CuRI team established that though RICs may be providing services, which could generate income (and in the future also possible profit), their core purpose is to provide public good and stay a non-for-profit organization. This allows RIC to generate profit, but it needs to be reinvested into RIC's statutory activities, and not distributed to its shareholders. Therefore, the *for profit* option of becoming a general or limited partnership company was ruled out at the get go.

As a non-for-profit entity, RICs have four options to organize their legal structure. These are: i) association of legal persons (entities), ii) not-for-profit organization, iii) a foundation or iv) a civil association. These legal forms have different characteristics and offer various levels of flexibility in terms of potential future modification of membership, performed activities, financial responsibility etc. As RICs will likely be established by more legal entities (e.g. regional and/or municipal authority, research organizations, companies, other non-profit organizations and/or associations, but not natural persons) its choice was ultimately reduced to becoming an association of legal entities or non-profit organization. In the CuRI3 report, the WB indicated that an association of legal entities seems the most suitable legal form for RICs to enable them to achieve their envisioned goals. Its key characteristics are presented in Box 3.

BOX 3: Association of legal entities - key features

Members: The legal entities as founders may be either from the private (e.g. entrepreneurs) or the public sector (e.g. non-profit organizations, universities, region, cities). Natural persons cannot be founders of the association, even if the natural persons would be entrepreneurs.

Business activities: Besides achieving its main purpose, the association can perform business activities. However, these business activities may never be the association's main activity. These can be only supplementary in a way that through these activities the financial needs of the association can be covered or its further development may be supported. The achieved profit from business activities must be entirely used for the association's founding purpose. RIC will be liable regarding its liabilities towards third parties with its entire assets.

Establishment: The establishment of the association is a two-stage process. First, the association may be established either by a written agreement on the establishment concluded between the founders or the establishment of the association is approved during an establishment meeting of the founders. The main constitutional document of the association are its articles of association, which must be enclosed to the above-mentioned agreement on the establishment or to the minutes from the establishment meeting of the founders.

Articles of association: The articles of association must specify the association's name, seat and the scope of activities, the financial aspects of the association, the creation and termination of membership in the association, the bodies of the association, incl. their competences, the manner of termination of the association and disposition of the liquidation balance.

Finances membership: As regards the financial aspects, the articles of ALE generally need to regulate how each of the founders/members will contribute to the activities of the association, the description of the association's assets and how these assets might be used, the description of the earnings (e.g. possible interest from provided microloans, rental fees, if the association will lease a part of its premises to third parties) and costs (e.g. wage costs of employees, rental fees) of the association. The founders/members may be entitled to provide cash contributions to the association – however, this is not a statutory requirement.

Organizational structure: The bodies (organizational organs/entities) of the association are not defined by Slovak law. This can be considered as an advantage, since the founders have flexibility as regards the creation of these bodies and their rights and obligations. In practice, at least three organs should be considered – the meeting of the members as the association's main body, the director (president) as the association's executive body and the supervisory board as the association's supervising body.

Source: CuRI3 R&D report, 2022.

Currently, BBSK and KSK are using different models for operating RICs. In the case of BBSK, innovation-related activities are being managed under the BBSK Regional Development Agency (RDA) *Dobry kraj*, which has a legal status of a non-for-profit organization. While RDA is not a part of BBSK regional administration, it is 100% owned by the regional government. In the case of KSK, the RIC has the status of an association of legal entities (ALE) that is composed of five members (region, Košice city and three public universities¹²).

Although the selection criteria of the measure 1.1.1. are not yet public, it is expected that a wide range of legal entities will be eligible for applying. Hence, from the point of view of accessing 1.1.1. funds, the legal form **does** not seem crucial because both ALE and non-profit organizations will be eligible beneficiaries. At some point of CuRI work, it was discussed that different groups of potential applicants to the measure 1.1.1. could have different co-financing requirements, however, this seems not the case any more.

One additional legal structure that could be considered by Slovak regions when thinking about IIPs that could apply for the measure 1.1.1. is a consortium. In this case, a consortium which could be understood as an IIP (in terms of the measure 1.1.1.) would not need to be equal to a RIC. The consortium is created by at least two individuals or entities on the basis of a consortium agreement, which specifies consortium members, division of tasks, responsibilities and budget. A consortium does not have a legal personality - it pools resources of its members and aims at achieving a specific goal or project, however, it does not require an equity stake into a consortium (opposite to a joint venture). This option was discussed with both CuRI regions, however, it was decided it was not suitable to implement in specific CuRI conditions. In the case of KSK, it is because the region already has RIC that is a multi-stakeholder entity and creation of a consortium is not needed. In BBSK the key aspect seemed to be time. Preparation of a consortium agreement and agreeing on tasks, responsibility and budget division takes time, while it has been expected that the publication of the

measure 1.1.1. would happen very soon. An appealing feature of a consortium is its ability to bring together different stakeholders and entrust them with specific tasks, responsibilities (targets) and budget that are spelled out in a consortium agreement.

The application for 1.1.1. funds has an important implication for RICs' legal form because, most probably, it will result in a lock-in of a legal form of an applicant/beneficiary. This is because the EU funds that were awarded through a call for application cannot be easily transferred from one legal entity to another legal entity. For example, in the case of BBSK, if the RDA were to apply for and was awarded 1.1.1. funds, it would not be able to transfer these resources in the future to a newly established association of legal entities, if the region were to choose to create such an entity in the future. In other words, the moment of application for 1.1.1. resources will have long-term consequences for the structure and functioning of the regional innovation ecosystems.

The exact length of this lock-in is currently unknown. It still needs to be verified, whether the same legal entity would be responsible for maintaining project results during the so-called durability period, that is after the project's end. The durability period in the non-infrastructure heavy projects financed with EU funds usually lasts up to five years.

8.2. ORGANIZATIONAL STRUCTURE

The organizational structure of RICs should enable dynamic and agile adaptation to changing needs and available resources. At the stage of preparing this report, it is expected that during the initial years of RICs' functioning a significant source of their financing will come from the measure 1.1.1., as this is to be a dedicated instrument for nurturing regional innovation ecosystems. However, external projects (e.g. other EU-funded or else projects) are also likely to be an important contribution. One should expect such externally-funded individual projects being of different sizes, different durations and requiring the involvement of different competences and resources. Particular emphasis should therefore be placed on the ability to scale the organization up (e.g. when new opportunities arise) and down (e.g. when ongoing projects come to an end). In each case, this should be done while maintaining and securing the knowledge and experience acquired during projects execution, as well as the ability to identify, acquire and launch subsequent projects in the future.

For the reasons indicated above, the organizational structure of RIC is recommended to be based on four types of resources:

- **RIC's core team** - providing base functions and ensuring RIC's basic operations (core activities) regardless of the number of projects currently being handled.
- **Expert and mentor pool** - a pool of external experts (individuals), who provide just-in-time and on demand services for RIC and its clients.
- **Volunteer pool** - potentially from secondary schools, high schools and universities, loosely associated with RIC and providing operational support for projects (e.g. organizing events, conducting surveys).
- **Subcontractors and partners** (legal entities) - with known and verified competences cooperating in the acquisition and/or execution of projects and activities.

Core team

The core team consists of people permanently associated with RIC with long-term contracts (e.g. employment contracts), for whom RIC is their main place of work. Such people should have job security, regardless of the sources of financing obtained by RIC in the course of its activities. The core team should, in principle, be responsible for i) the daily management of RIC, ii) conducting current affairs of RIC, regardless of its current scale of operations, which will vary depending on the number of implemented projects, and iii) implementing technical activities that are considered the core technical focus of RIC's mission (e.g. innovation trainings for individuals). In addition to being responsible for the functioning of RIC as a typical organization, this team should have competences in the following areas:

- preparing strategic and operational documents for RIC and operationalizing their implementation
- identifying external sources of financing and assessing them in terms of the appropriateness of using them to implement the RIC strategy
- preparing documentation and conducting the application process for projects co-financed from external funds
- managing the implementation of projects co-financed from external funds (project management)
- settling accounts of projects financed from external funds, including handling possible inspections
- delivering core technical activities
- collecting, maintaining and managing organizational knowledge created in RIC
- conducting human resource activities enabling the quick acquisition of resources necessary to implement projects, including maintaining relationships with experts, mentors and volunteers
- conducting basic reporting and information activities for the RIC's founders
- conducting basic promotional activities of RIC.

The organizational structure of the core team should, in principle, be constant throughout the entire period of RIC operation. It should not be subject to frequent fluctuations, and any changes should rather be related to its expansion in line with the increasing scale of RIC activities. For example, this may apply to teams responsible for acquiring and settling projects, or to teams of project managers. Any changes to this structure should be made with particular care to create mechanisms and procedures to ensure the retention of organizational knowledge in RIC.

Expert and mentor pool

Experts and mentors are a group of individuals or entities loosely associated with RIC, whose involvement in cooperation with RIC is irregular. These individuals should, in principle, have unique competencies and experience necessary to ensure the high quality of services provided by RIC. In general, it's assumed that employment at RIC is not their main source of income. Experts and mentors may encompass various subgroups of individuals and entities that have different competences, different legal forms of cooperation with RIC (e.g. framework agreements) and are used by RIC in different ways. For example:

- **scientific experts** - may come from local ROs and be used ad hoc, based on contracts pertaining to the delivery of a specific activity or output to local companies
- **business experts** - can come from all over Europe and be used in start-up incubation and acceleration programs as mentors, taking part of the equity in such start-ups, or as experts providing courses and having framework agreements with RIC
- **business angels** - can come from the local ecosystem and be used as the first sources of financing for locally established start-ups without any formal connection with RIC, but only based on the network of informal connections built by RIC and aimed at tightening relations within the region.

These three examples do not exhaust the spectrum of all available possibilities, but only illustrate the most typical relationships. Defining individual groups of experts and mentors, determining the strategy for acquiring and maintaining them, as well as setting the principles of cooperation with such groups will be individual for each region in Slovakia and should result from the strategy adopted by RIC. The importance of and need for having access to different groups of experts and mentors can also vary over time.

The creation and management of a pool of experts and mentors is a long-term activity that requires constant communication and maintaining relationships with them. It should take into account various motivations of experts and mentors (not only financial, but also related to e.g. prestige). Moreover, RIC should apply a mechanism for assessing the quality of experts and mentors by people and entities receiving their support. It is also recommended to include a mechanism for open discussion within these groups enabling giving and receiving feedback. Finally, when creating such a network, RIC should focus from the very beginning on acquisition of experts and mentors not only from the local ecosystem, but also from supra-regional and international area.

Volunteer pool

Volunteers are a group of individuals, who want to get involved in RIC activities. CuRI team assumes such people will be mostly recruited from regional secondary schools, high schools and universities. In general, volunteering for RIC is for such individuals an opportunity to gain experience that can be used in their future work. Often young individuals look for opportunities in co-organizing international events with a recognizable brand or participating in international projects. They usually do not expect remuneration or formal affiliation with RIC, but an important element motivating them to be involved in a relation with RIC may be the RIC's support for their other activities (e.g., scientific circles, prototyping laboratories) or the ability to demonstrate a valuable experience in their resume.

This group should be perceived at least through two dimensions. First, it is a resource characterized by very high motivation and commitment, which RIC can, at relatively low costs, use to conduct its activities, in particular events such as conferences, workshops or surveys. Second, it is a group of proactive people with entrepreneurial attitude, constituting a natural ingredient of teams capable of creating and implementing innovations, leading to the creation of local start-ups. In the latter context, investment in such people should be treated as one of the RIC's goals, and RIC's involvement in supporting volunteerism may be one of the ways to identify and select talents participating in incubation or acceleration programs.

One of RIC's objectives should also be building and strengthening relationships between the group of volunteers and groups of experts and mentors when organizing events and implementing projects. This is a natural way to build informal bonds between the older, experienced generation and the younger, entrepreneurial generation. It is also the easiest way to retain talent in the region by building strong local relationships and networks.

Subcontractors and partners

The last group of resources enabling RIC to apply for and implement projects and activities are subcontractors and partners, i.e. legal entities. Building a network of trusted and verified subcontractors and partners providing RIC with high-quality services necessary to implement projects, as well as preparing the RIC's organization (i.e. the core team) to manage relationships and cooperation with such subcontractors and partners (e.g. tender procedures) will be pivotal for RIC's success. Such entities can be divided into three main groups:

- **subcontractors** providing commercial services to RIC necessary for project implemented by the center
- **partners (e.g. NGOs)** providing various services and activities for the ecosystem, which may complement the activities implemented by RIC or implement a subset of activities within the projects managed by RIC
- **partners (e.g. research organizations, enterprise associations, VCs, international networks)** constituting an important, but independent element of the ecosystem (e.g. ensuring the inflow of knowledge and capital necessary for the development of the start-up), which do not enter into direct business relations with RIC, but whom RIC must attract and convince to cooperate in the development of the regional ecosystem.

The model proposed above implies the use of a matrix structure in which project teams extend the core team and the core organizational structure. Members of the core team usually take responsibility for building project teams and for providing those project teams with the knowledge and expertise maintained by the organization. The members of project teams are selected from the pool of experts and volunteers, taking into account individual project budget and scope.

8.3. FINANCIAL STRUCTURE AND SUSTAINABILITY

RICs in both CuRI regions are conceived as non-profit entities, in KSK as an ALE and in BBSK as a unit within the Regional Development Agency. This means that any profit generated by RICs needs to be reinvested in their statutory activity. Such an approach is recommendable, because it is expected that many RICs' activities will not be profit generating although they will be providing important value added for the regional innovation ecosystem. Results of some of RICs' activities will have a public good character, e.g. raising awareness of society, shaping innovation-prone attitudes and skills of individuals (BBSK created a network of innolabbs, i.e. physical spaces with equipment that is offered to individuals for experimenting and prototyping¹³; RIC KSK offers (free of charge) professional equipment for podcast recording to regional students), data gathering and information sharing, promotion of innovation, networking of stakeholders.

To ensure RICs' long-term operation and ability to deliver their goals, they need to work out a sustainable financing model. In principle, RICs should strive towards achieving financial independence (at least to cover its core budget and core team - more details in the section 8.2.) because this would ensure their stable functioning and a fair dosage of political independence. However, generation of stable and sizable revenue streams takes time and is unlikely to take place in a short term (below five years). For that reason, CuRI partners agree that during initial years public financing will be an important part of RICs' funding.

RICs will rely on three main revenue streams, external projects, members' contribution, and commercial revenues. External projects refer to mostly public resources such as EU funds and will take shape of the regional envelope of the measure 1.1.1., national projects (usually financed by EU funds that will include other measures than the 1.1.1.), Interreg, Horizon Europe etc. Naturally non-EU projects are also possible. In the case of KSK RIC, members' contributions are mainly of two kinds, annual membership fees from its five founders and additional transfers from its members. Here the main financier is expected to be KSK regional authority. In BBSK the main financier will be region channeling funds through the Regional Development Agency. Commercial revenues relate to fees collected for services provided on a commercial basis, such as office rental, provision of services, and at the later stage these could include revenue related to technology transfer (licenses) or exits from successful startups. See the end of this section for more detailed description of these financial sources.

Initially RICs will be mainly financed by projects and contributions from its members with limited own commercial revenues. The key project that is expected to finance RICs is the measure 1.1.1. in the Slovakia Program. It is expected that both regions will have an allocation of roughly EUR 10 million in this program (draft version indicated time horizon 2029 and no requirement for regional co-financing). The details of this call for proposals have been evolving during the last year and are to be published shortly. Both RICs also apply for additional external projects. KSK RIC for instance obtained additional financing from the Interreg. During the last year and a half, the main source of funding of RICs has been public funds (regional budget and nationally-managed EU funds). This will remain so till the announcement of the measure 1.1.1. It is expected that this measure will not allow financing all activities foreseen as RIC activities, hence additional funding sources will be an important contribution to the funding mix and mid-term regional commitment is critical. The commercial revenue stream will be initially limited. For instance, at the end of 2023, KSK RIC opened the "Startup Campus" (a coworking space), a physical space refurbished with region's funds that is now being commercially offered to individuals and entrepreneurs.¹⁴ RIC KSK is also operating a program called "Startup Factory"¹⁵ designated for supporting startup creation. Some of its elements could be commercial, while some could be free of charge and financed through RIC's statutory activities, like the "Founders' Challenge" that is aimed at developing secondary school talent. These revenues, however, will not have a major impact on the financial situation of the RIC.

With time, RICs are expected to generate an increasing amount of their own revenue streams. However, revenues from projects and members will remain an important element of the financing mix. The stream of its own revenues is important because it will guarantee RIC's stability (for instance its core team and activities) and will mitigate the risk of mission creep. The latter arises when an institution is solely project-financed and concentrates too much on achieving goals of individual external projects and not own objectives. Another challenging feature of project-based financing is its cyclicity. Projects start and end at very specific dates, which can generate cash flow issues if potential gaps between projects are not covered with other sources of funds. Stable funding will offer RICs an opportunity to steadily develop their capacities to manage more complex activities and deliver expected goals.

RICs' potential revenue streams are the following:

Regional budget: as a regional unit in the form of an independent association (KSK RIC) or as a budgetary unit of the regional administration (BBSK), the source of financing may be funds allocated from the region's own budget for the implementation of RIC activities. This method of financing is limited by the financial possibilities of the region's budget and statutory tasks of a region and RIC. However, this source of funding also carries risks of political influence on RIC's activities and staffing, which could be mitigated by diversifying center's revenue streams.

Other public funds: RICs can be financed by central administration (ministries or governmental agencies) through partnering with these national entities that implement activities at the local or regional level. This financing may take the form of a targeted grant for RIC or direct budget allocations. According to CuRI findings, this form of funding is currently not planned. Potentially, when national projects (e.g. innovation voucher projects for companies) are launched, RICs could become a regional partner in their implementation and obtain funding to cover costs of their involvement.

EU-funded projects: the EU allocates funds for the development of innovation, including activities supporting the development of business environment institutions. By supporting a wide range of initiatives, from basic research to innovation implementation, the EU aims at ensuring that businesses have access to services that help them innovate, become resilient and able to meet the challenges and opportunities of the future. RICs have a number of opportunities to apply for EU funds for the implementation of projects that fit into their goals approved by their shareholders. It seems that these EU co-financed projects will be the main source of financing for the Center's activities in the coming years.

An additional important source of resources could be JTF. Both BBSK and KSK are eligible for accessing these funds. However, details related to JTF calls for applications still need to be announced and currently the regions do not have a clear roadmap to accessing them.

In addition to these national calls, RICs could also benefit from international competitions, under programs such as Horizon 2020 and its successor Horizon Europe, Interreg, LIFE as part of partnership projects with partners from various countries and sectors. Such international activity is strongly recommended for RICs, as it creates not only additional sources of financing, but also unique competences and is an opportunity to exchange experiences at the EU level and build a network of partners.

Commercial revenues: In order to reinforce RICs' financial independence, it is necessary to have a portfolio of commercially provided services that can be presented to a wide range of customers. RICs could offer group or individual training programs, networking events, speaker sessions, organization of conferences, B2B events etc. to businesses, entrepreneurs, and startups. It could also develop a range of advisory services, for instance related to areas such as: facilitating companies' access to external funding (e.g. applications for projects), settling the accounts of such projects, developing business strategy, financial management, marketing and innovation, investment advice, supporting entrepreneurs in raising funds, preparing business plans, and negotiating with investors.

Stakeholders contribution: in the case of RICs that operate as an entity created by a group of shareholders, one source of revenue will be their regular contributions to the RICs' budget in order to implement the tasks indicated in the organization's statute. This model fosters a sense of community of regional interests and ensures a steady stream of income. However, this approach requires high commitment of all stakeholders and usually depends on their financial capabilities. Regular membership fees could be further supplemented with additional contributions of RICs members.

Public-Private Partnerships: RICs can collaborate with private sector entities, including corporations, businesses, and industry associations. These partnerships may involve joint projects, sponsorships, or contributions from private organizations.

Venture Funding and Investments: When planning potential areas of RIC activity, it is also worth taking into account involvement in facilitating the financing of ventures or investments in start-ups and innovative projects, or even participating directly in them. The returns on these investments may contribute to the center's financial stability in the future.

8.4. BUDGET CREATION AND STRUCTURE

Once RIC's mission, vision, strategic objectives and legal structure are decided, an iterative process starts that operationalizes these elements; the budget is one of key elements of this process. The budget is a resultant of political ambitions and pragmatism related to expectations of what's possible to be achieved in a specific time, context and with planned resources.

The work on budget is an integral part of designing the RIC, as there are many feedback loops between such topics as staffing, activities, indicators and targets. Changes in any of these areas will automatically require adjustments in the others. Once strategic goals are set and the subsequent pillars and activities together with their indicators are proposed, one needs to verify them against the budget and see whether they match (e.g. whether resources - human and financial - allocated to a given activity seem sufficient to achieve targets). If the numbers do not add up, they need to be aligned, which may lead to refining strategic and operational goals. Several iterations are likely to be needed to obtain coherence between goals and means. Consultation with lawyers is likely to verify the eligibility and legality of planned mechanisms and activities. During this process, one needs to offer clear definitions of goals and operationalize them with specific and measurable indicators that can be attributed to RIC's activities. For that reason budget preparation takes time and experience.

RIC's budget will be used for different purposes, hence it will need to be presented from different angles. Three most obvious applications, in the case of RICs, are the following: i) a budget will serve the RIC management to monitor the RIC's financial and substantive performance against intended targets, ii) it will be used as an element of application for funding, such as the measure 1.1.1., and iii) demonstrate to stakeholders RIC's priorities and concentrate RIC's efforts on specific targets, to avoid mission creep. For that reason, RIC's management needs to prepare the budget for different uses and audiences.

When preparing a budget, it is recommended to apply a clear and coherent structure that reflects RIC's objectives. This will help flexibly and accurately monitor RIC's pillars, the following division could be applied: activities, projects and tasks.

Activities indicate RIC's main areas of actions as they are to achieve RIC's goals. For instance an activity is (i) "provision of innovation-related trainings to individuals", (ii) "establishing regional innovation observatory", or (iii) "strengthening networking between ecosystem stakeholders". Activities are measured with RIC's indicators. They can be financed from different sources (e.g., internal funds, or external projects). The right approach is to look for best sources of financing to support these activities and their goals instead of redefining them and their goals, trying to fit into available financing sources.

Projects reflect the way money is divided in the budget and they are the basic level of accounting. Projects can be financed with internal or external funds (e.g. EU grants/loans). A single project can finance more than one activity, and a single activity may be financed by more than one project. The budget construction should allow easy incorporation of new projects and deletion of finished projects without affecting the structure of RIC's activities and their objectives.

Tasks are the most granular level of action and constitute a sub-division of projects. A single task has to be assigned to a single project. This may sometimes also be called a 'project activity', but such a 'project activity' should not be confused with RIC's 'main' activities (described above) that are the key means to achieve RIC's objectives.

During CuRI several approaches ('views') to present RIC's budget were proposed. They were proposed with the view that RICs will use it for applying for the measure 1.1.1. However, since the measure 1.1.1. expected assumptions have changed several times over the last year and a budget template for this measure is not yet public, the aim of this exercise was to offer a useful managerial tool to RICs without overinvesting resources in this process. The key aim is to disaggregate data in the way that would help RIC managers 're-package' it the way that will be required by the measure 1.1.1. final documentation. The recommended budget 'views' are the following:

- **Revenue overview:** first of all, it's a general description of expected revenue sources and expected amounts divided in fiscal years.
- **Annual costs of specific categories:** a 'view' presenting costs of specific categories in a given fiscal year (preferably disaggregated by months), for instance staffing, own actions (conferences, data gathering, awards), external companies/experts (mentors, technical experts, lawyers etc.), operational costs (office, accounting etc.), consumables, marketing etc.
- **Annual staff's time assignment:** allocating time of RIC's employee between all planned projects and activities
- **Multi year cost of specific categories:** a summary of annual costs per spending category in every fiscal year of the planned budget
- **Multi year staff's time allocation:** a summary of staff's time allocation in every fiscal year per projects and activities

Preparing these simple 'views' through the budget should not be complicated and has several advantages. First, the more detailed the presentation of budget categories is, the easier it will be to use it for the sake of preparing a budget for the 1.1.1. application and verifying RIC's budget assumptions against the measure 1.1.1. requirements. For instance, it is assumed that the measure 1.1.1. documentation will specify maximum percentages of budget allocation per specific categories (staff, travel, consumables etc.). By preparing the RIC's budget in a presented fashion, a RIC manager will be able to aggregate data to categories presented in the measure 1.1.1. and check whether RIC matches these conditions.

The second advantage this approach offers is a clear demonstration of RIC's priorities. By looking at numbers related to staff's time allocation per project and activity as well as detailed cost categories (both can easily be aggregated at the pillar level), it is evident where most of RIC's resources are allocated and where they are missing or are low. This works as a good reality check between declarations expressed in RIC's vision, mission and strategic goals and planned activities and their indicators.

Third, such a disaggregation also shows the general efficiency of RIC's functioning. Detailed division of cost categories indicates how much budget is spent on staff, what type of staff and how much for activities and their types. It is assumed that a good ratio is from 20% to 30% administrative costs (staff, office etc.) and from 70% to 80% activities. This ratio, in general, is not recommended to move beyond 40% to 60%, respectively, as this would imply high project management costs.

The proposed 20/30% - 80/70% split of administrative and activity costs should be measured at the level of the overall budget and individual projects. Depending on the character of an individual project this split may vary (it will also depend on the source of financing and its conditions), however, at the level of the overall budget it should not exceed the proposed values.

The cost-based approach also has some deficiencies. It can lead to isolation between different departments ('pillars') as each category operates independently of the others. A certain disadvantage is also the limited strategic approach because it focuses mainly on the division of individual cost categories, without analyzing their differences in detail. These risks however, are more pronounced in larger entities that have bigger staff and a wide range of activities. In the case of Slovak RICs that are young institutions with a low level of complexity, they should not pose significant challenges in the initial years of operation.

At the later stage of development, RICs would be recommended to apply a task-based budgeting, which is more complex but also more accurate and strategic. Budgeting based on tasks is a strategic financial planning approach that involves allocating resources according to specific tasks, projects, or functions within the organization. This method provides a detailed breakdown of how funds are distributed across various projects and activities, allowing for better control, transparency, and alignment with organizational goals. Tasks-based budgeting is a dynamic process. It requires a deep understanding of organizational aspects and the ability to adapt to a changing financial landscape. Regular evaluations and adjustments will ensure that the budget remains not just a financial plan, but a strategic tool to guide the RIC team in achieving its goals. This approach provides a more detailed view of where resources are allocated and helps in identifying areas for optimization. It is necessary that each undertaken task is interpreted in financial terms and has a direct impact on the achievement of the planned results.

The WB team recommends that RIC's budget reflects the proposed organizational structure and is divided into core budget and project-dependent budget. The former could be described as a minimum budget that RIC requires to finance its core team and core activities (see Section 8.2.). This budget should be relatively stable, though may gradually change over time. The project-based budget can be volatile because it will depend on RIC's ability to tap different external funding sources (e.g. EU projects or commercial projects).

RIC will likely need to keep two separate budgets due to the state aid regulations. One related to economic activities and one for non-economic activities. Such duality will require RIC to demonstrate which assets and resources are used for generating revenues in non-profit activities, and which in commercial activities. Without such differentiation RIC will not be able to carry out economic activities, since it will be financed to a large degree with public funds.

9. APPENDIXES

These two/three-page overviews were prepared in May 2023 to present (in an abbreviated format) the general concept of RICs in BBSK and KSK. Their content has been evolving since then. However, such a format is a useful way of presenting a current state of thinking about the region's intention regarding RICs. It encourages regional stakeholders to define key challenges and opportunities, vision, strategic objectives/key activity pillars, specific activities. Ideally these would be complemented with measurable indicators to make them clearly understandable. The material also presents targeted beneficiary groups and key responsible actors. By attaching key programs and activities (and their indicators) to the pillars, regional stakeholders can easily verify the balance between the pillars, and their importance. If activities and indicators do not seem sufficient, this paves the way for further discussion and potential redesigning of the concept. The process of preparing such a two-pager should go hand in hand with preparing RIC's budget, where a similar check regarding the balance and importance of pillars and key programs in terms of share of allocated funds and staff time is conducted.

9.1. CONCISE OVERVIEW: BBSK RIC (MAY 2023)

Resulting from complex learning processes and interactions between multiple actors, innovation is much more than research and development. It pertains to design, engineering, management and entrepreneurship as well as to organizational, social practices and applied technologies. In contemporary economies innovation is becoming a catalytic driver of sustainable growth. Recognizing the transformative power of innovation as a catalyst for economic growth, BBSK's Regional Innovation Strategy (RIS 2023-2025) sets out to boost BBSK's competitiveness by elevating its innovation capital through the active involvement of the private sector, education and research institutions, regional administration, civil society and start-ups.

BBSK's RIS (2023-2025) is also based on the extensive mapping of its regional innovation ecosystem, its needs and future perspectives conducted under the CUR1 initiative (2019-2023). During the mapping, the Regional Innovation Center (RIC) was identified as a needed instrument for elevating the competitiveness of BBSK's regional innovation ecosystem. This brief concisely summarizes the strategic outlook and key activities of BBSK's RIC (2023-2027).

1. NEEDS BASED RATIONALE

- The lowest IPK index - 36.22% (PSK 42.65%, BA 64.03%)
- The second lowest share of SMEs in the Slovak Republic, the most significant annual decrease of 2.8% (SR 0.3%)
- Only 9.5% of Slovak SMEs are situated in BBSK, the growth of newly emerging businesses decreased by 8%, which is the highest among all regions.
- BBSK enterprises participate the least in exports in the Slovak Republic
- The lowest representation of young entrepreneurs under the age of 30 in Slovakia
- The average nominal monthly wage is the second lowest and lowest GDP among the regions, second lowest GDP/capita
- Loss of talent, depopulation of the region
- Decrease in the number of students at local universities.
- Missing systematic concept for entrepreneurship education
- Lack of above mentioned defines the needs to slow down or reverse declining trends by means of:

- Building and connecting fragmented ecosystems
- Networking and staff exchange schemes in order to build professional capacities in the region.
- Support for the identification of investment projects in region in terms of innovation
- Mapping of innovation ecosystem
- Data collection within the innovation ecosystem
- Need to network between all stakeholders of innovation ecosystem.
- Awareness building within the innovation ecosystem.
- Organization of educational activities within the innovation ecosystem
- Centralizing information with aim to disseminate - for the benefit of all stakeholders
- Preparation and updates of regional innovation strategies
- Fulfilment of RIS3 implementation plan on regional level
- Support of start-ups and SMEs – acceleration services, scale-up services, mentoring services
- Regional voucher schemes to stimulate growth of innovative start-ups.

2. POLICY ALIGNMENT

The RIC design has been extensively considered and is in full compliance with pertinent current national, regional strategies and the CURI initiative as per table below.

Strategic Alignment	National RIS3	National Innovation Strategy	Regional Innovation Strategies	Integrated Territorial Strategies	CURI reports	IIP concept	International good practice
Needs identification			x	x	x		x
Strategic goals	x	x	x	x	x	x	x
Operational goals			x	x	x		x
Activities		x	x		x	?	x
Legal form			x	x	x	x	x

3. ANTICIPATED/CURRENT OPERATIONAL FORMAT

RIC BBSK is currently a unit under the Regional Development agency. Currently with one employee, the plan is to have 2 employees by May and 3 employees by June 2023 with the perspective of 5 full time employees by the end of 2023.

Further development will depend on the currently negotiated funding from measure 1.1.1. under Program Slovakia.

4. REGIONAL COMMITMENT SO FAR

To stimulate collaboration between research organizations and industry, first sub-component focused on designing a regional innovation voucher (RIV), a novel instrument tailored for BBSK to promote R&D collaboration. The voucher was designed and implemented in collaboration with the Ministry of Economy, Slovak Innovation and Energy Agency:

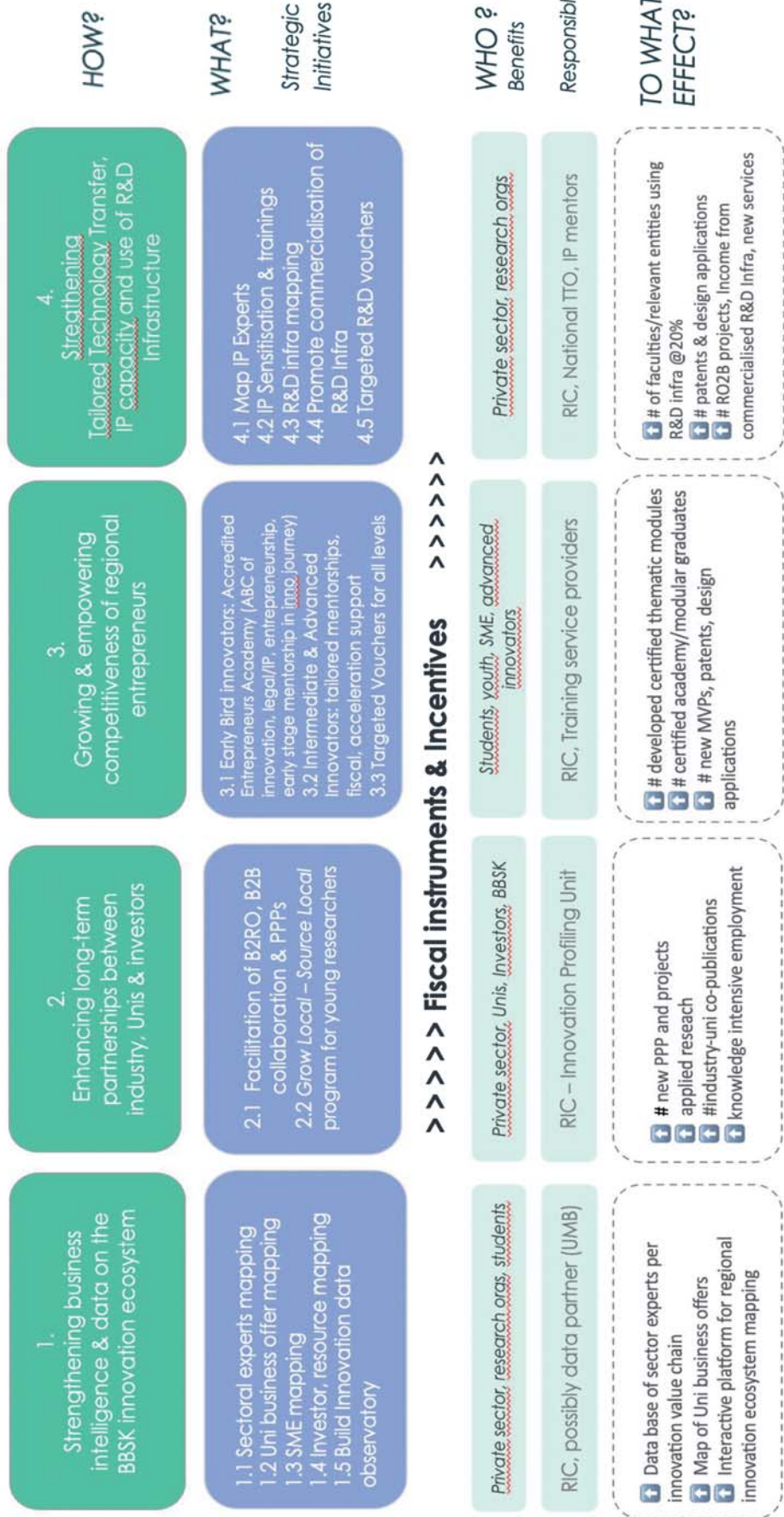
- The regional innovation voucher scheme was launched in June 2021 with a planned budget of EUR 2 million. Eventually almost EUR 1 million was distributed, 193 companies applied and 52 vouchers were awarded.
- The rollout of the innolabb concept responds to low entrepreneurship skills among youth and lack of physical spaces for prototyping innovative ideas. It also responds to BBSK companies' interest to connect with talented students.
- In August 2021 innolabb was extended into a project titled "Verification of the model of counselling centres for youth in the Banská Bystrica Region" and obtained national and EU financing. BBSK's Regional Development Agency proceeded to expand innolabb's rollout into seven additional locations in BBSK as a part of Youth Centers SPACE. Now there are 7 innolabbs in the region.

- To build a strong base with the appropriate skill sets we actively participate in a program such as *Rozbehni sa! My machine, Show your talent, Junior Achievement* , Schools for Democracy, STEAM activities
- RIC capacity building - Innovation Study visits to France, South Moravia, Rzeszow
- Stimulating Industry-university networks – Innovation Meetup - The first meeting of innovation stakeholders (nearly 100 participants) of the region took place at the Technical University in Zvolen in March 2023. Young innovative companies were introduced, participants had the opportunity to get to know each other, network and connect. University’s interesting projects were introduced to SMEs. This meetup was a first step toward community and trust building among the stakeholders.
- Till December 2023 3 Innovation Meetups at Universities in BBSK, 1 thematic event with workshops
- Co-organization of Hackathon i-Days: Student competition to tackle health challenges
- Technical Workshops on the Commercialization of R&D Infrastructure among 4 institutions and 12 participants.
- We are working on introducing a new university subject –“The Entrepreneurial Academy” to build entrepreneurial skills among students and development of a business model.

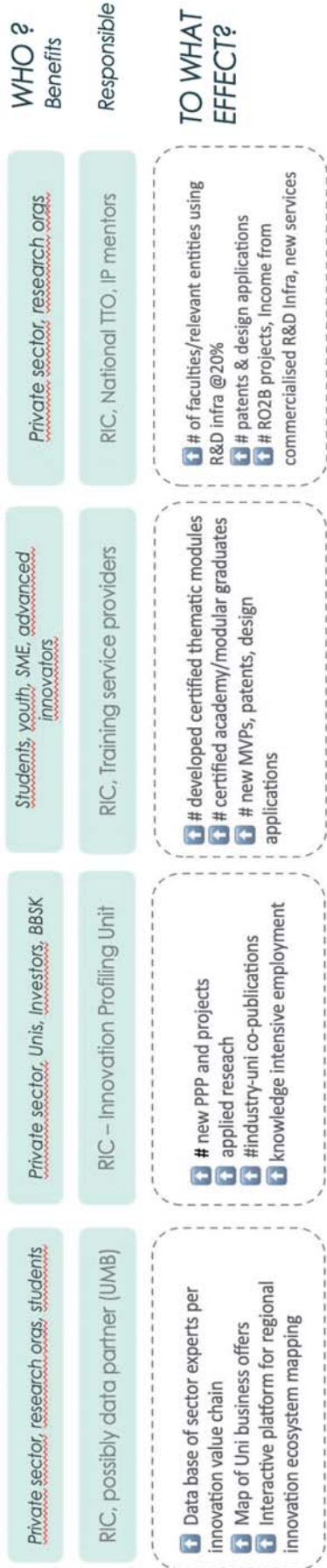
5. KEY ACTIVITIES FOR FINANCING CONSIDERATIONS UNDER OP 1.1.1

- STATUS QUO & KEY GAPS TO BE ADDRESSED**
- SK & BBSK's underperformance on EU Innovation Scoreboard
 - BBSK's strong unis, industry base, agro, high-tech sectors
 - High trends in youth & brain drain
 - Insufficient industry-RO connection
 - Low public spending on RDI
 - Diverse regional skills gaps for economic growth
- WHY?**

Vision: Boost competitiveness of BBSK by elevating its innovation capital.



>>>>> Fiscal Instruments & Incentives >>>>>



9.2. CONCISE OVERVIEW: KSK RIC (MAY 2023)

Since 2019, within the CURI initiative, KSK region has been extensively involved in the mapping of its regional innovation ecosystems, its needs and future perspectives as drivers of regional socio-economic growth. During these efforts, the Regional Innovation Center (RIC) was identified as a needed instrument for stimulating the growth of KSK's existing regional innovation ecosystem. This brief provides a succinct synopsis of KSK RIC's strategic outlook, its key activities and financing options. The RIC's detailed conceptual design, operational and budget business plan are also readily available upon request.

1. RIC AS A CATALYST FOR REGIONAL DEVELOPMENT

RIC KE seeks to advance the regional innovation ecosystem by proactively including the key stakeholders within the innovation triangle. It is systemically linking secondary school education (early bird talent pool), universities (more advanced talent pool) and business creation programs (enablers). RIC KE aims to significantly decrease brain drain, to introduce entrepreneurship skills into formal secondary education thus to increase the talent pool of innovators in the region. It will do so by providing business consulting and mentoring services to start-ups, SMEs and regional companies and thereby becoming a spot where talent, young innovators and more advanced entrepreneurs can realize their potential, enhance their employability and grow. RIC KE stands to offer a place where business ideas meet business opportunities.

2. NEEDS BASED RATIONALE

- On most of the European Innovation Scoreboard's metrics Košice region is below to the European average
- Declining GDP compared to Western Europe, technological and innovation challenges visible in cross-sectorial domains
- From 2018 - 2020 the population of the region decreased by almost 20,000 citizens
- With almost 23,000 of students in the region's universities, we count in the city around 45 start-ups, comparing to Helsinki with almost 40,000 students and around 524 start-ups
- Missing systematic concept for entrepreneurship education at secondary school level, inadequate data causes limited linkages between students' needs and university offers
- Inexistent financial support in the region for supporting early-stage start-ups
- Blurry, inconsistent data and awareness about innovation and entrepreneurship, insufficient profiling of regional innovation capital for attracting new investments.

3. POLICY ALIGNMENT OF RIC

The RIC's design has been extensively thought through, it is in full compliance with pertinent current national, regional strategies and the CURI initiative as per table below.

Strategic Alignment	National RIS3	National Innovation Strategy	Regional Innovation Strategies	Integrated Territorial Strategies	CURI reports	IIP concept	International good practice
Needs identification			X	X	X		x
Strategic goals	x	x	x	x	X	x	x
Operational goals			x	x	X		x
Activities		X	X		X	?	x
Legal form			X	x	X	x	X

4. OPERATIONAL FORMAT

CURRENT MODE

Entrepreneurship program - RIC KE is currently providing a pilot program to 8 regional secondary schools as limited resources do not allow to extend the program to more schools.

Business mentoring for SMEs - providing business consulting services for maximum 2 SME per month, demand is triple times higher.

Business creation programs for start-ups/SME - planned pilot focused on professional business development of selected start-ups – now in a limited format due to lack of staff with business expertise.

Mentoring services - free or voluntary services for selected start-ups.

Knowledge and innovation community - organizing conferences and regular meet-ups.

Anticipated format: RIC KE would like to extend its existing offer with additional resources by providing a wider range of services at a high-quality and professional level. The planned activities will be focused on: business consulting services for regional companies, setting up of a paid mentors pool for ecosystem start-ups or SMEs, funding services - pre-seed investments in the form of convertible loans, incubation services including office place, networking services with strong focus on sector domain key players and possible investors, requalification, up skilling and educational programs helping start-ups and entrepreneurs in the ecosystem to become competitive and to grow.

5. ACTIVITIES FOR FINANCING CONSIDERATIONS UNDER OP 1.1.1

STATUS QUO/ Gaps to be filled/ KSK`s uniqueness-assets

- SK`s & KSK underperformance on EU Innovation Scoreboard Ecosystemic Challenge/
- Insufficient talent for local market
- Secondary school curricula not in sync with market needs; entrepreneurship lacking
- Solid pro-innovation university, industry base & regional political will
- Potential for building 3 unicorns with +1M investment in 5 years

WHY?

We connect innovative business ideas with entrepreneurship opportunities



6. REGIONAL COMMITMENT SO FAR & LONGER-TERM PERSPECTIVES

Founding members have committed themselves to support the RIC KE financially and operationally. The core supporter of the RIC KE is the Košice self-governing region, who is currently providing majority of RIC KE's limited budget, as well as some operational capacities e.g. offices and other support. In order to deliver the outlined objectives, the RIC KE needs to augment the resources and provide targeted investments for the ecosystem activities. IIP funding is essential for the significant improvement of the RIC KE's impact within the region. Our ambition is to implement a systematic approach to the continuous development of the innovation ecosystem in the Košice region based on the quadruple helix model and thereby contribute to innovation, job creation and overall regional economic growth.

NOTES

- 1 European Commission. (2022) Partnership Agreement with Slovakia 2021-2027/ Policy Objective 1. https://commission.europa.eu/publications/partnership-agreement-slovakia-2021-2027_en
- 2 <https://mirri.gov.sk/sekcie/investicie/strategia-vyskumu-a-inovacie-pre-inteligentnu-specializaciu-sr/>
- 3 https://vaia.gov.sk/wp-content/uploads/2023/05/01_Narodna-strategia-vyskumu-vyvoja-a-inovacie_vlastny-material_V2.pdf
- 4 <https://mirri.gov.sk/wp-content/uploads/2019/10/SDT-English-Version-FINAL.pdf>
- 5 The Regional Innovation Strategy of the Košice Self-Governing Region was adopted in June 2021 (<https://web.vucke.sk/files/sk/kompetencie/regionalny-rozvoj/koncepcne-materialy/tris/vo05zast25bod11-5main.pdf>) and the Regional Innovation Strategy of the Banská Bystrica Self-Governing Region (2023-2025) was adopted in November 2022 (<https://www.bbsk.sk/regionalna-inovacna-strategia-bbsk-2023-2025>).
- 6 See the RD&I reports from CuRI2 and CuRI3 for details related to the framework for releasing R&D infrastructure for commercial use.
- 7 <https://www.sario.sk/sites/default/files/sario-research-and-development-2022-01-11.pdf>
- 8 <https://datacube.statistics.sk/>
- 9 There are several approaches to this helix model in the literature, mostly referred to as the triple, quadruple and quintuple helix. Their most important premise is that innovation is created in the ecosystem that is made of the following elements: industry, academia, administration, society, natural environment. For that reason, this report uses the term ‘multiple helix’ to refer to this model.
- 10 “ePionier” is an original Polish spelling of the program name that means ePioneer
- 11 More information on the KSK RIC’s website <https://ickk.sk/>
- 12 Technical University of Košice (TUKE), University of Pavla Jozefa Safarika (UPJS) and University of *Veterinary Medicine* and Pharmacy.
- 13 <https://www.tvojspace.sk/Banská-bystrica/>
- 14 <https://ickk.sk/coworking/>
- 15 <https://ickk.sk/startup-factory/>
- 16 A limited number of activities that took place in the first quarter of 2022 are also mentioned, since they directly relate to core activities described in this report.
- 17 CuRI2 Report is available at <https://www.worldbank.org/en/region/eca/publication/slovakia-catching-up-regions>.
- 18 Status for the first quarter of 2022.
- 19 More Information available at <https://sapie.sk/news/innovation-vouchers>
- 20 World Bank (2020), Linking industry and research in the Banská Bystrica region (BBSK): <https://documents1.worldbank.org/curated/en/099055201252224628/pdf/P173029045964c0d10b85a056fe0349ae52.pdf>. Companies in the Kosice region that were interviewed during the CuRI3 program by the World Bank team provided a similar feedback.
- 21 Data at the moment of report finalization.
- 22 The registry of Eligible Researchers of Innovative Projects.
- 23 <https://www.mhsr.sk/search?search=-datab%C3%A1za+opr%C3%A1vnen%C3%BDch+rie%C5%A1ite%C4%BEov>
- 24 Application for potential providers to list in the MoEcon’s registry <https://www.mhsr.sk/uploads/files/TV0JVf2e.pdf>
- 25 In future editions, it is recommended to test direct payment between SIEA and a provider to minimized beneficiary’s financial risk.
- 26 Initially, RIC was named InnoBBSK.
- 27 AmCham Slovakia (2022), On a Mission to Innovate, CONNECTION 1/2022 accessed at <https://amcham.sk/publications/issues/2022-1-human-capital-education-and-labor/article/273628/on-a-mission-to-innovate>
- 28 Regional Innovation Centers were already advocated in and supported by the 2008-2010 national innovation policy (see https://www.siea.sk/wp-content/uploads/inovacie/dokumenty/navrh_inovacna-politika_2008_2010.pdf) but their funding was discontinued in 2011 and they do not operate in three Slovak regions participating in CuRI.
- 29 The CuRI2 Report also provides information about gaps related to research organizations and the national level.
- 30 The BBSK organized an online survey that encompassed university and vocational education schools’ students in the region. Almost 1,400 students were surveyed and 90 percent respondents welcomed the establishment of such a student-company platform in the region.

- 31 3,120,639 EUR (88%) from the total is obtained from EU Structural Funds (OP Human Resources 2014-2020), and 368,310 EUR (12%) from Slovakia`s national budget (Ministry of Labour, Social Affairs and Family).
- 32 Procedural Manual for Submission of National Project (Proposals): Verification of the model of counselling centers for youth in the Banská Bystrica Region pursuant to § 26 of the ESI Funds Act, Chapter 3.4.1 National ESI Funds Management System Projects (2014-2020).

