NEWSLETTER

Southern Catalonia, Knowledge Region

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The knowledge engine

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Editorial

The European Union has aligned its policy to the pursuit of one main goal: to make innovation a priority for all regions. For this reason, this mandate focuses on strategic and innovative projects, catalysing competitiveness and creating added value. The principal aim is to make society progressively fairer, more cohesive and happier by promoting its knowledge base.

In this context, the RIS3 strategy (Research and Innovation Smart Specialisation Strategy) has been designed to assist regions in implementing their own smart specialisation strategies and boosting the sectors of economic specialisation that encourage competitiveness and internationalisation across the European regions.

What role does the university play in this smart specialisation strategy? In this edition the article "Regional policy, RIS3 and universities" invites you to think about the role of the university in this strategy. The interview with Dr. Castellanos Maduell, General Secretary of the Department of the Vice Presidency and of Economy and Finance of the Catalan Government, shows the importance of the RIS3CAT strategy for Catalonia and gives greater insight into its instruments and monitoring systems. Also, Jordi Cartanyà Solé, executive director of Demola Southern Catalonia discusses Demola Global as a collective intelligence tool that promotes talent and collaboration among agents to develop open innovation strategies. In the good practices section, we present the Italian region of Trento,

which has become a good example of governance and smart specialisation. Finally, the company Biosfer Teslab, a spin-off of the URV resulting from university research, is presented as an innovative success story in the biotechnology sector.

What is your vision of the future after reading this edition? We invite you to participate with your comments and opinions to make more knowledge-based society.

Francesc Xavier Grau Vidal

Director of the Chair for University and Knowledge Region URV

European Regional Policy, RIS3 and universities

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EUROPEAN REGIONAL POLICY, RIS3 AND UNIVERSITIES

by Francesc Xavier Grau Vidal

In the previous chapters we have seen how and why European regional policy has incorporated knowledge society criteria into eligibility for cohesion funds through the requirement of regional and national smart specialisation based on research and innovation, i.e. RIS3. It is clear from this vision and definition that each region needs to possess knowledge-related assets such as research centres, technological centres, hospitals and, especially, universities. Universities are the nucleus of the knowledge society because of their dual role as educators of citizens to the highest levels – necessary in a knowledge-based production system (bearing in mind the 40% target in higher education in a cohort set by Europe 2020) – and generators of fundamental and applied knowledge in all fields of science.

Despite the above, the RIS3 programme does not involve the knowledge structures explicitly, although these structures, especially universities, are permanently invited. Such caution probably has something to do with the need to preserve the institutional autonomy inherent to the definition of a university in an advanced and democratic Europe, where any relationship of functional dependence between the university and the administration and/or institutions of political governance must always be avoided. Whatever the reason, universities are clearly invited to become involved in regional development strategies, and administrations are encouraged to promote and ensure their involvement.

Numerous significant documents have been published by the European Commission in this area. In preparation for the 2014–2020 seven-year programming period, in 2011 the then Regional Policy and Education, Culture, Multiculturalism and Youth commissioners (Johannes Hahn and Androulla Vassiliou) signed a joint document entitled <u>Connecting</u> <u>Universities to Regional Growth: A Practical Guide (A guide to improving the contribution of universities to regional development, with a view to strengthening economic, social and territorial cohesion, in a sustainable way)</u>. Below we reproduce the introduction to this joint document in full since it perfectly describes the direction the RIS policy will take and the role they hope the universities will play:

The Europe 2020 strategy highlights the key role of innovation in contributing to smart, sustainable and inclusive growth. Regions are important sites for innovation because of the opportunities they provide for interaction between businesses, public authorities and civil societies.

In meeting major societal challenges, which have both a global and local dimension, universities and other higher education institutions have a key role to play in knowledge creation and its translation into innovative products and public and private services, a process that can engage the creative arts and social sciences as well as scientists and technologists. This role has been highlighted in the agenda adopted by the Commission in September 2011 for the modernisation of Europe's higher education systems.

A range of mechanisms are available to facilitate this translation process. These include advice and services to SMEs, the placement of graduates in these businesses, incubating spin-offs in science and technology parks, facilitating networks in business clusters and meeting the skills needs of the local labour market. All of these activities and many more can be supported under Cohesion Policy although the conditions of this may vary across regions according to the priorities and rules implemented by the managing authorities of the related operational programmes.

This EU Guide "Connecting Universities to Regional Growth" has been designed to enable public authorities to promote the active engagement of universities and other higher education institutions in regional innovation strategies for smart specialisation, in cooperation with research centres, businesses and other partners in the civil society.

It can also be used by academic and economic partners to explore the benefits they can expect from working together for regional development. Moreover, this guide might support those interested in submitting an application to the RegioStars award 2013 on this topic, based on good practice co-funded by Cohesion Policy.

To maximise the effectiveness of universities in contributing to regional growth, the guide provides an analysis of their possible role and presents a range of delivery mechanisms. It explores how to overcome barriers, to build capacity and to implement partnerships and leadership processes to interconnect the partners in regional innovation systems. These issues are illustrated by practical examples and case studies taken from a range of sources and policy documents.

It is not an academic publication but a practical tool with recommendations, part of a series of guides prepared in the framework of the Smart Specialisation Platform set up by the Commission for providing methodological assistance and practical guidance to national and regional policy makers involved in designing and delivering innovation strategies for smart specialisation. It is intended to facilitate discussions between the stakeholders.

This guide will be useful for preparing the next programming period (2014-2020). Indeed, under the proposals recently adopted by the Commission for the future Cohesion Policy Regulations, delivery mechanisms presented here would continue to be eligible, including technical assistance, provided some conditions are fulfilled, such as an appropriate innovation strategy for smart specialisation.

All the regions can make the full use of the last years of the current programming period to test, improve and support delivery mechanisms presented here for better connecting universities to regional growth. Moreover, universities will appreciate the opportunities that their regions present for their activities as 'living laboratories' opened to international linkages.

The document provides a set of recommendations for governments and the universities. Significantly, these recommendations were based on the study of **five cases of well-established relationships between university and region** selected from across Europe. Also significantly, one of these cases is that of the **Universitat Rovira i Virgili and its role with society in southern Catalonia**.

The basic Commission document that should serve as a guide for developing smart specialisation strategies is the <u>Guide to Research and Innovation Strategies for Smart</u> <u>Specialisations (RIS3)</u> (2012). This document makes constant reference to: the crucial role of universities and research centres ("...it is crucial that knowledge is identified and activated elsewhere, such as in universities or public research institutes"); their necessary involvement at the initial stages when smart specialisation strategies are drawn up, vision is configured, and studies aimed at diagnosis and revision are planned; and their leadership role and contribution to governance ("Universities and other knowledge institutions should be closely linked to the process of designing national/regional innovation strategies for smart specialisation. They are needed to develop several steps of these strategies and they can also act as intermediary bodies for the implementation of several delivery instruments that are described in this guide").

Finally, among many other documents that describe and guide regional policy based on knowledge, we ought to mention <u>The role of Universities and Research Organisations as</u> <u>drivers for Smart Specialisation at regional level (2014)</u>, which, as the title implies, specifically describes the role that universities and research centres should play in the smart specialisation of the regions. As the authors of the document point out:

In the context of the current socio-economic crisis, coupled with an increasingly globalised economy, Europe and <u>its regions</u> are facing new challenges for economic recovery and growth. The concept of smart specialisation, based on the development and exploitation of the knowledge economy in a novel way, is one response to this new landscape, <u>aiming to bridge the gap between European regions</u> and also increase their competitiveness at a global level. HEIs (Higher Education Institutions) and ROs, as sources for the creation and dissemination of knowledge and innovation, have a critical role to play in this process. The question is how this can be achieved in an optimal manner.

This is therefore a fundamental document containing recommendations on universities and smart specialisation strategies for the European Commission, national governments, regional governments and universities. We cannot reproduce all of these recommendations here but they are worth taking into account. In any case, once again it is highly significant that the document cites three cases as examples: France and its platforms of competitiveness; Austria and its programme contracts between the government and

universities as tools for encouraging the involvement of universities in their regions; and Southern Catalonia and the involvement of the Universitat Rovira i Virgili in the economic transformation and industrial specialisation of the region.

The entry into force of the Europe 2020 strategy and in particular of the RIS3 requirements for eligibility for structural and cohesion funds is already beginning to affect university policy. By way of example, on the occasion of its 650th anniversary, the University of Vienna organised a seminar entitled "Global universities and their regional impact", where it called for precisely this regional impact role to ensure that those universities that are considered global were also taken into account. Leaving aside the self-designation of "global" university, what is significant is that a large university with as much history as the University of Vienna should also demand a regional role.

The Global University Network for Innovation (GUNi) is currently completing what will be its <u>6th World Report on Higher Education</u>. Significantly, its title this year is: *Towards Socially Responsible Higher Education Institutions, Globally and Locally Engaged*. The report analyses the need for a dual commitment on the part of universities to global society and the planet on one hand, and to their immediate society, which creates and supports them, on the other, i.e. what Grau (2016) defines as the "Glocal University".

By definition, public research universities are universal institutions inasmuch as knowledge is one and global, both when it comes to training at the highest level and when it comes to research. In this sense, they are institutions with a clear vocation and global projection. However, all are rooted in a place – a city, a region and a country – in which society at a given moment decided to create them and essentially supports them with public funds (while private universities may also be involved regionally or locally, this involvement is not necessarily one of their obligations). With significant differences from one country to another across Europe, every European country has nevertheless developed a public university system which, over the years, has fully extended across its respective territory, resulting in a system of regionally implanted universities.

Figure 1, extracted from *Territorial potentials in the European Union*, a publication by NordRegio (2009), provides a graphical image of the distribution of research universities across Europe, covering all territories and regions (NUTS2 regions are identified by the percentage of people of working age with tertiary level education). There are practically no regions without university towns or cities.

Figure 1. Distribution of universities and their identification with NUTS2 regions



Table 1 provides an overview of the size of these systems in countries with similar dimensions to Catalonia (i.e. Sweden, Austria, Denmark, Finland and Ireland, plus the addition of Scotland, a NUTS2 region of a similar size to Catalonia and a good, century-old university system). Although this is a relatively small group of countries (which enables a comprehensive study to be made), it provides a sufficiently representative overview of the university systems in Western Europe (the EU-15 countries before the incorporation of the Eastern European countries, whose university systems are in transformation).

Table 1. Data from the university systems of European countries with similar dimensions to those of Catalonia

Year 2013	Sweden	Austria	Denmark	Finland	Scotland	Ireland	Total for the group	Catalon
Population (in thousands)	9.609,00	8.468,60	5.515,10	5.440,00	5.327,70	4.593,10	38.953,50	7.553,7
GDP (MC per current prices)	436.342	322.595	252.939	201.995	210.262	174.791	1.598.924	206.61
GDP/capita	45.410	38.093	45.863	37.131	39.466	38.055	41.047	27.353
Public Research Universities	14	22	8	14	18	8	84	8
Public Teaching Universities	20	21	9	27		13	90	
Total Public Universities	34	43	17	41	18	21	174	8
Private Universities	3	12				6	21	4
Total Universities	37	55	17	41	18	27	195	12
Population/Total number of Universities	259.703	153.974	324.418	132.683	295.983	170.115	199.761	629.47
Population/Public Universities	282.618	196.943	324.418	132.683	295.983	218.719	223.871	944.20
Population/Public Research Universities	686.357	384.935	689.389	388.571	295.983	574.138	463.732	944.2
GDP/Total number of Universities (MC)	11.793	5.865	14.879	4.927	11.681	6.474	8.200	17.21
GDP/Public Universities (MC)	12.834	7.502	14.879	4.927	11.681	8.323	9.189	25.82
GDP/Public Research Universities (M€)	31.167	14.663	31.617	13.428	11.681	21.849	19.035	25.82
Students in Public Research Universities	252.617	309.074	161.443	167.179	215.600	126.479	1.232.392	227.0
Students in Public Teaching Universities	91.627	43.593	70.398	138.880		65.866	410.364	
students in Private Universities	20.319	8.086				11.788	40.193	25.72
fotal number of students	364.563	360.753	231.841	306.059	215.600	204.133	1.682.949	252.7
Fotal students in Public Universities/thousand inhabitants	36	42	42	56	40	42	42	30
Fotal students/thousand inhabitants	38	43	42	56	40	44	43	33
Base finance from government for Research Universities (M ϵ)	4.249	2.678	2.136	1.750	1.266	698	12.776	788
otal income of Public Research University (M€)	5.541	3.612	3.544	2.758	3.496	2.011	20.962	1.44
fotal income of Public Teaching University	920	838	753	1.078		560	4.149	·
Total income of Public University (M€)	6.461	4.450	4.279	3.836	3.496	2.570	25.111	1.44
Base finance for Research Universities as % GDP	0,97	0,83	0,84	0,87	0,6	0,4	0,8	0,38
fotal income of Research Universities as % GDP	1,27	1,12	1,4	1,37	1,66	1,15	1,31	0,7
Base finance for Public Universities as % GDP	1,13	1,09	1,07	1,32	0,6	0,61	1,01	0,38
fotal income of Public Universities as % GDP	1,48	1,38	1,7	1,9	1,66	1,47	1,57	0,7
Base finance for Research Universities/student	16.820	8.665	13.228	10.469	5.871	5.17	10.367	3.42
Total income of Research Universities/student	21.934	11.687	21.952	16.498	16.215	15.897	17.009	6.35
Base finance for Public Universities/student	14.382	9.970	11.662	8.698	5.871	5.562	9.842	3.42
Total income of Public Universities/studient	18.769	12.618	18.534	12.535	16.215	13.363	15.286	6.35
Base finance for Research Universities/inhabitant	442	316	387	322	238	152	328	103
otal income of Research Universities/inhabitant	577	427	643	507	656	438	538	191
Base finance for Public Universities/inhabitant	515	415	490	489	238	233	415	103
Total income of Dublic Hole and the Schubble of	677	575	770	705	656	560	645	101

The table also includes economic data, which is for information only since they will not be used in this section. However, these data also enable a comparison of the economic dimensions to be made and the distance the Catalan university system still has to grow to be calculated. The relevant data for this section are:

- Most universities are public (89%). This is a much higher percentage than for Catalonia (67%). This is also true for the other EU-15 countries, while in the Eastern European countries the number of private universities is increasing.
- Public universities receive the vast majority of students (97%). The figure for Catalonia is 90%.
- The majority of European countries (including those not in this table) have a dual system of teaching and research universities. This is not true in Catalonia (or in Spain, Italy or France).
- In these countries there is one public university for every 200,000 inhabitants (in Western Europe as a whole, there is one for every 400,000 inhabitants). In Catalonia there is almost one for every million inhabitants, i.e. in comparison, the Catalan public university system is highly underdeveloped.
- There is one public research university (which is the most important type as far as the generation of knowledge is concerned) for every 500,000 inhabitants (one for every 700,000 inhabitants in Western Europe as a whole). Since Catalonia does not have teaching universities, there is also one public research university for every million inhabitants.
- The total number of university students in Catalonia, both by university and population, is 25% lower than in the countries in the table. This indicates there is potential for growth in this category as the knowledge economy develops and the demand for university education grows.

Table 1 and Figure 1 show how the distribution of a country's research universities can, because of their size, constitute an effective network of nodes for generating and transmitting knowledge with a regional impact that is compatible with each institution's global requirements.

Like a country's other large public infrastructures (such as tertiary hospitals), research universities require sufficient human, physical and, of course, economic dimensions to guarantee training and knowledge generation at the global level in all areas of knowledge. Table 1 shows that the public resources they receive vary from country to country, though in a comparable order both from the economic and the human perspectives. European research universities (which are mainly public) require total funds ranging from 600 to 800 euros per capita, or between 1.1 and 1.4% of GDP. In absolute terms, this means a population of around 500,000 people and/or a GDP of around 20,000 million euros. These reference numbers are important because they show which human and economic dimensions are needed if a region, supported by an internationally competitive research university, is to have full capacity to undertake complete projects in the knowledge society. Table 1 also shows that Catalonia (and more so the Tarragona region) should further develop its university system in addition to further developing its knowledge economy. What is also evident from the table, however, is that the Tarragona region, with 800,000 inhabitants and a GDP of 20,000 million euros, has a human and economic dimension that is more than sufficient to sustain a complete knowledge system.

Main conclusions from section

- Universities, as well as the other knowledge infrastructures (research centres, technological centres, etc.), are requested to engage in regional smart specialisation strategies. Universities are identified as crucial players help to construct the vision, design, implementation and monitoring of these strategies.
- 2. European research universities, the vast majority of which are public, constitute a knowledge network covering every region of Europe and could constitute the nucleus of RIS3 strategies, engaging in developing their region as a knowledge region.
- 3. A research university must be of a sufficient size to guarantee the quality of its global impact in all areas of knowledge. It is therefore also necessary that the human and economic dimensions of the region that sustains it should be sufficient. These are estimated to be a population of around 500,000 people and a GDP of around 20,000 million euros a year.
- 4. The Tarragona region has sufficient human and economic dimensions to sustain a comprehensive research university.
- 5. Both the Universitat Rovira i Virgili and the Catalan public university system as a whole need to grow (in number of students but especially in resources) to meet the demand for education and research generated by the development of the knowledge economy.

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For further information on this topic, please see the document: **GRAU, F.X.**, <u>Southern</u> <u>Catalonia, Knowledge Region</u>, Publicacions URV, 2016.

The alliance for innovation: Demola comes to Southern Catalonia

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Demola is a global alliance for co-creation between organizations and universities. The platform was born in Tampere (Finland) 10 years ago and developed by Nokia and the Technological University of Tampere to rise to the challenge of helping both organizations and big companies with a wealth of resources to explore innovation and the future through new multidisciplinary and innovative perspectives. This is the main contribution of university students when they work as members of co-creative teams with professionals from organizations to generate solutions (demos) to real challenges.

<u>Demola</u> has a presence in 26 places in 4 continents, and involves more than 1,000 public and private organizations as well as 65 universities which have carried out more than 4,000 innovation projects. Demola Global has come to Southern Catalonia thanks to the Rovira i Virgili University. This is one of the main aims of "<u>Southern Catalonia, Knowledge Region</u>" and it came about as a result of a visit to Tampere two years ago, when our region started the process for the URV to become one of Demola's facilitators.



What is the added value of Demola?

The organizations that are allied to Demola and which use this open co-creation tool have adopted the culture of innovation. This has enabled them to open up to new business and services, to set up new challenges and to make the new technologies in their area of activity available. Moreover, professionals point to the importance of Demola as a way of interacting with university students, who can provide different, rewarding points of view.

So far more than 20,000 university students have participated with Demola worldwide. With Demola they learn innovative methodologies, interact with multidisciplinary teams and experience reality by working on real cases to develop new solutions or prototypes.

Cities and regions where Demola has been implemented have high rates of innovation. In some of them, Demola is part of the clusters and innovation platforms as one more tool of co-creation and open innovation.

The universities that have joined the programme can see that their students have access to a unique learning experience. They can improve their professional abilities while they are acquiring personal capacities. They point out that the intensive work they do reinforces their self-confidence.

How Demola works

The organizations that want to join this initiative have to sign a framework agreement with Demola Global and the URV, after which they study the projects that need to be developed and explored. Once the projects have been detected, they are presented to the URV students, who then undergo a selection process. Likewise, the organizations select professionals who will be part of the team with the students.

The projects are carried out for eight intensive weeks using Demola's co-creation methodology, facilitated by a Demola-certified expert in teamwork and innovation methodologies. At the end of the working sessions, the results are reflected in a prototype that includes all the information generated by the co-creative and decision-making process.

It should be pointed out that both students and organizations have the right to exploit the final results and the organization can buy the full rights. Some teams of students decide to explore the possibility of creating a start-up, an increasing trend that Demola Global will encourage in the coming years.

Demoola Southern Catalonia

<u>Demola Southern Catalonia</u> was set up one year ago. In this implementation stage in the region, many allied organizations would like to systematically develop this tool as an innovation strategy. Reus City Council, the URV or ICS-Camp de Tarragona are just some of the public institutions that work with Demola. In the private sector, Grup Candor S.A. and Grupo Pintaluba both leading multinationals in their respective sectors have already engaged with the platform.

Some of the projects are involved in global challenges, which search for the answer to questions like: What will the transport of the future be like? What services do the general public require? What is the focus of the university learning experience? Is animal production possible without antibiotics?

This is the result of Demola in our region and it opens up the way to (re)thinking the role of universities and their students in the development of innovation ecosystems. In the future, Demola Global may include different forms such as worldwide teams, the Erasmus-Demola program, multi-companies or institutional projects and may also provide many opportunities for the global innovation network that is now present in our knowledge region, Southern Catalonia.

Jordi Cartanyà Solé

Executive Director of Demola Southern Catalonia, Universitat Rovira i Virgili

"RIS3CAT defines a broad and shared vision of the future"

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Why is the European Union committed to the smart specialisation of the regions? What opportunities does it offer?

Research and innovation strategies for smart specialisation (RIS3) support the economic and knowledge specialisations that best suit the resources, capacities, and skills of each territory, and reinforce their potential for innovation. Depending on their economic and international function, EU territories must define their RIS3 in terms of global trends, their position in the international chain. With the RIS3, the European Union wants to make European investment in research and innovation more coherent and maximise impact on economic and social development in the territories and in Europe as a whole.

The European Union promotes the orientation of regional research and innovation systems and public policies towards the challenges of society, the needs of citizens and collaborative innovation, promoting innovation and research as a driving force for social transformation.

How is the smart specialisation strategy in Catalonia implemented?

The RIS3CAT defines a vision for Catalonia: a country with an industrial base, and an open, competitive and sustainable economy, which combines talent and creativity. In addition, there is a diversified business and research system based on excellence in the context of a dynamic, entrepreneurial and inclusive society. In the country, multinationals and local companies coexist with well-established, international sectors and emerging technology sectors.

RIS3CAT identifies seven sectorial areas of specialisation and six enabling technologies that should facilitate Catalonia's transition towards a more competitive, sustainable and inclusive model. The RIS3CAT Action Plan, which is updated annually, contains the instrument for supporting research and innovation financed by the ERDF. In Catalonia, smart specialisation is regarded as a dynamic process that is the result of the investment decisions taken by Catalonia's agents, both companies and universities and other research and innovation agents.

RIS3CAT has designed instruments that are aligned to the needs identified. Which instruments implemented by **RIS3CAT** would you highlight?

The best-known instruments are the RIS3CAT and PECT communities, but RIS3CAT also promotes other innovative and transformative instruments such as public investment in innovation and the Catlabs programme.

How is the strategy monitored? Are there any quantitative data on impact? What is your assessment so far?

The European Commission wants to encourage discovery processes, through RIS3, such as participatory forms of governance, with monitoring and evaluation systems that focus not only on achieving objectives, but also on a process of discovery and learning in which the agents of the quadruple helix can participate.

The monitoring system must help us to understand how the research and innovation ecosystem works in all its dynamic complexity (sectorial specialisation, technologies, actors, interrelationships, international connections, etc.) and must provide us with new evidence to inspire new public policies and new dynamics.

In the near future, we plan to present the first version of an open digital platform (RIS3-MCAT) that will enable the collaboration networks of RDI agents and companies in Catalonia to be mapped on the basis of data from projects selected through competitive calls for proposals financed with European funds. The platform facilitates the segmentation of entities and projects into sectorial areas and technologies, as well as the analysis of trends and research and innovation communities and networks in emerging areas and in collaboration with international partners. It will be a key tool for all actors in the research and innovation system, and will help us to make evidence-based strategic decisions.

RIS3CAT projects are monitored with quantitative and qualitative indicators. It is still too early to assess the impact. A mid-term evaluation of RIS3CAT will be carried out in 2019, while the final evaluation will not take place until 2023.

Do you think that there are now greater links between the public and private spheres, and between science and technology?

Without any doubt, RIS3CAT has helped to organize collaborative projects and use scientific and technological knowledge to respond to the challenges of companies, public administrations and the general public.

This is a bidirectional and iterative process that has taken into account a variety of parameters and criteria and has involved different stakeholders. It also requires multi-level governance. How has it been organized?

The leaders of the RIS3CAT are the agents of the innovation system. In particular, they are universities, research and technology centers, the public administration and companies that access the ERDF to undertake strategic innovation projects and generate economic and social value for the country. RIS3CAT promotes collaboration between various agents and puts into practice innovative projects and actions designed to solve economic and social challenges.

The RIS3CAT monitoring system envisages the active participation of all the agents involved, so that learning can be shared and public policies in support of innovation and the economic and social impact of projects can be improved.

The territorial specialisation and competitiveness projects (PECT) aim to generate innovative economic activity at the regional level. Partnerships between various actors are one of the basic requirements. What is the outcome of these strategic governance proposals? What impact do they have on Catalonia as a whole?

The PECT is an innovative instrument, a reference in Europe because Catalonia is one of the few territories that have actively involved local authorities and implemented the RIS3. PECT has been activated so recently that it is still too early to talk about its impact. In fact, 30 million euros has been allocated to 25 PECTs, with 144 actions in Catalonia. There are some very interesting projects, which are generating new dynamics of collaboration between regional agents, and especially between universities and local authorities. The PECT will undoubtedly have an important direct impact on the territory. The next call is scheduled for the end of the year. In addition, the Catlabs programme is working on the codesign of different agents, with an approach oriented towards collective impact in both economic and social terms.

It could be said that this collaboration between the agents of the quadruple helix has fostered competitiveness in Catalonia. Could you give us a case study?

The collaboration among the agents of the quadruple helix to find innovative answers to our social concerns is probably the main challenge of RIS3CAT, and, without any doubt, will contribute to the competitiveness of the country. The next RIS3CAT monitoring report is scheduled for the end of the year and it will include the first success stories. What should make us think is that the most successful examples are the result of strategic planning, which has not been improvised because of a call for proposals, but has probably matured and become a reality.

How is the vision of the future shared by agents from different regions of Catalonia?

RIS3CAT defines a broad and shared vision of the future. The challenges to which RIS3CAT wants to respond and the instruments used to organize this response involve agents from all over Catalonia. With the RIS3CAT communities, companies, universities and other research and innovation agents work together to implement an agenda to transform industries based on research and innovation. With the PECTs, local authorities, universities and other innovation agents collaborate on projects for the transformation and creation of economic and social value in the territory. Through public procurement of innovation, public administrations work together with business and other actors to develop innovative responses to societal challenges.

In other words, RIS3CAT is a transformative agenda that mobilizes and organizes resources and capacities in the region to develop innovative responses. The RIS3CAT instruments enable the country to progress towards a more sustainable, inclusive and competitive development model, by generating new opportunities and economic and social value.

How have the various agents and the Catalan regions been involved in decision-making on innovation policies?

RIS3CAT was designed by stakeholders working in groups and public consultation. But the most important role of the agents and the regions is the prioritization of the areas of specialisation by promoting and undertaking research and innovation projects with co-financing from the ERDF. From a strictly territorial perspective, for the first time, the PECTs have guided the innovation strategies agreed to by local agents, some of which have had a regional scope. The experience of the first PECT call is useful to see the scope, strengths, and weaknesses of involving local and regional actors in the definition of innovation strategies.

What specific role does the university play in RIS3CAT? And apart from this strategy, what role should the university play in the governance of the regions?

Universities play a key role in the generation, dissemination, and application of knowledge for the competitiveness and sustainable development of the territory. In RIS3CAT, universities actively participate in almost all the instruments. They collaborate with companies and public administrations and contribute to developing innovative solutions to the challenges of society. Training and the generation and transfer of knowledge must continue to be its main contribution to moving towards a more sustainable, inclusive and competitive development model.

Studies of good practices in Knowledge Regions: Trento

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Studying other knowledge regions enables us to identify good practices in other regions. In this issue we introduce Trento as interesting region because of its governance and smart specialisation programme

In the previous issue, our analysis of general and specific aspects of European regions such as <u>Malaga</u> identified a variety of good practices. In the same issue Trento was shown to be an interesting region because of its governance and smart specialisation.

Economic and sectorial considerations

The autonomous province of Trento, from now on Trentino, has been classified by the European Union as a NUTS3 region. It has a geographical area of 6,207 km² and 538,579 inhabitants (117,317 of whom live in the city of Trento).

Trentino represents 0.88% of the population of Italy and 0.94% of the country's GDP ($33,700 \in GDP$ per capita). It is an area with a highly tertiary economy, whilst the industrial and primary sectors are of less importance.

University education system

The <u>University of Trento</u> is the centrepiece of Trentino's university system. Created in 1962 by Bruno Kessler as the University Institute of Social Sciences, it is currently 37th in the <u>THE</u>'s Young University Ranking (2012) and between 251st and 300th place in the World University Ranking (2018). The University of Trento has two campuses (Trento and Rovereto), which have a total of 17,749 students (8% of whom are international) and 1,324 workers.

On the other hand, advanced vocational training is provided by the Edmund Mach Foundation (<u>FEM</u>) largely in the agricultural, agri-food and environment sectors. Furthermore, the advanced vocational training programmes have a considerable economic impact that covers 30 institutes with more than 6,100 students.

Research, Development and Innovation (RDI)

The investment in RDI in Trentino amounts to 1.84% GDP. There is a university, two foundations, 12 research centres and 20 research institutes, which have a total of 3,526 workers (2.4% regional average and 1.5% national average) of whom 1,800 belong to the public sector. The leading institutions are the University of Trento, the Bruno Kessler Foundation (<u>FBK</u>), the Edmund Mach Foundation and the Hub Innovazione Trentino (<u>HIT</u>).

The University of Trento strategically focuses on research, training and learning, civic development and talent (see Figure 1). The focus on research has a variety of strategic goals such as transversal research, optimization of resources and knowledge transfer.

The Bruno Kessler Foundation has 400 researchers and 7 research centres which work in such areas as materials analysis, manufacture of micro-devices, design of energy systems and information innovation systems. Likewise, the Edmund Much Foundation (FEM) focuses on the primary sector, with a total of 350 workers and 3 research centres. Finally, mention should also be made of the HIT, a consortium of companies that discloses the RDI results in Trentino, and whose aim is to use technology transfer to make innovation readily available throughout the regions.



Smart Specialisation Strategy (RIS3)

The autonomous province of Trento has its <u>own</u> smart specialisation strategy (<u>RIS3</u>) which was drafted and implemented in 2014 by the provincial government. The strategy was designed using a bottom-up approach involving the stakeholders in Trentino's RDI system, who took part with the aim of promoting regional development.

The result is a strategy that aims to improve the region's competitiveness by focusing on its main strengths. Four areas were chosen: mechatronics (the <u>Polo Meccatronica</u> is the ideal forum for regional stakeholders to work together), energy and environment (Trentino generates 9% of the hydroelectric energy for the whole country), quality of life (well-being as a resource for tourism, culture and sport) and agri-food (high quality products and designations of origin in the wine sector, fruticulture and horticulture).

Governance

The two main stakeholders in the governance system are the <u>Government of the</u> <u>Autonomous Province of Trento</u> and the agency <u>Trentino Sviluppo</u>. The former is the regional government which has legislative and administrative powers, as well as financial autonomy. It is also the regional authority on such matters as planning, administration and regional development. The latter is an agency created by the government to promote the regional development of Trentino through innovation and regional competitiveness.



The region is governed by these two institutions. The government puts into practice policies and territorial strategies. Then, Trentino Sviluppo transfers the policies to the business sector through their involvement in clusters, territorial promotion and RDI. Companies take an active part in the governance system, and the other stakeholders (university and

foundations) also have their own voice in the provincial government.

Comparison with Southern Catalonia.

We have analysed two regions that have much in common in terms of economics and culture. Likewise, they both have an important tertiary sector and an industrial sector in which energy is an important factor.

The university systems also have a lot in common: for instance, they both have a single university that plays a leading role in the region and in the research system having both remarkable international impact.

There are also similarities in RDI strategies, the knowledge-based model of regional development, and the innovation-based structures such as research centres and transfer offices.

In terms of public administration there are some differences. In spite of the fact that they are both provinces, Trentino is autonomous and has legislative and administrative powers and financial autonomy (Italian state sends back 90% of taxes).

This means that Trentino has its own smart specialisation strategy (RIS3), while Southern Catalonia depends on the Catalan government and the <u>RIS3CAT</u> strategy. The Italian region, then, has made its own analysis of its specialisation sectors.

The existence of the regional development agency Trentino Sviluppo is a major difference between the two regions. The functions of this institution in terms of regional and economic development can also be identified in Southern Catalonia but they are divided up among various institutions and levels of administration.

In conclusion, Trentino is an interesting example for Southern Catalonia because of their cultural and economic similarities. The Italian region uses territorial competences to implement knowledge-based strategies of regional development. So Trento has a lot of potential as a point of comparison and a possible partner for the Southern Catalonia project.

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Discovering Southern Catalonia: Biosfer Teslab

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Biosfer Teslab is a spin-off of the Rovira i Virgili University and the Pere Virgili Health Research Institute, which provides an example on R+D+I business

In this section, we present those areas that are good examples of Southern Catalonia's status as a knowledge region. We discuss the economic, social, cultural and natural spaces whose peculiarities and characteristics constitute a social model based on knowledge, the objective of which is to help improve the quality of life of the people living in the region.

Spin-offs are one of the results of applying the knowledge generated by university research. Among others, in 2013, Biosfer Teslab (Reus) was created. This company is a spin-off of the Rovira i Virgili University and the Pere Virgili Health Research Institute, which uses Nuclear Magnetic Resonance (NMR) and other high-performance technology to diagnose cardiovascular risks in patients.

Its principal product is the Liposcale test, "an advanced lipoprotein test based on nuclear magnetic resonance (NMR)" [1] which provides more accurate results than habitual procedures. In particular, this innovative product makes it possible to determine the size and number of cholesterol and lipoprotein particles, which gives added value to clinical practice.



Among its potential clients, there are various pharmaceutical and food industries, analysis labs, research centers, and universities.

Research as a source of knowledge... and business

The spin-off is the result of two PhDs by Núria Amigó and Roger Mallol working as members of the URV's Metabolomics Platform, managed by Professor Xavier Correig in collaboration with the Research Unit in Lipids and Arteriosclerosis led by Professor Lluís Masana.

The Liposcale patent belongs to the Rovira i Virgili University and Pere Virgili Health Research Institute, and is a big step forward in the field of international health.

Biosfer Teslab has been awarded many scientific and business prizes: for example, it was a finalist in the 6th edition of BioEmprenedorXXI, VALORTEC, Big Booster (Boston), and Premis Gresol for Young Talent, and won the URV's Board of Trustees' Prize for entrepreneurial ideas, first prize of the 10th Premis ReusEmpresa, the Junior Chamber International of Tarragona Prize for medical innovation, and the Tarragona Provincial Council's Premis Empren.

Biosfer has also received funding from the URV's valuation unit, ACCIÓ, ENISA, the NEOTEC Programme, Torres Quevedo, and the Industrial PhD Plan.

R+D: innovation as a future guarantee

In its quest to guarantee competitiveness and innovation, Biosfer Teslab is seeking "collaboration for national and international projects that investigate new markers, analytical methods, and treatments that promote the study, diagnosis, and treatment of metabolic alterations" [2].

In 2014 Laboratoris Rubio injected half million euros [3] into the latest phase of the Liposcale test. Furthermore, the company has taken on the internationalization and commercialization of the product exclusively for the European market.

[1] This information has been checked online. See: <u>http://biosferteslab.com/en/services/</u> [Last consultation : 05/06/2018]

[2] This information has been checked online. See: <u>http://biosferteslab.com/en/services/</u> [Last consultation: 05/06/2018]

[3] This information has been checked online. See: <u>http://hemeroteca.lavanguardia.com/preview/2015/10/25/pagina-</u> 63/94425713/pdf.html?search=biosfer%20teslab [Last consultation: 05/06/2018]