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PGI05786 – IMPROVE

Improving Structural Funds for better delivery of R&D&I policies

Regional State of the Art Report

North-West Region, Romania

12.10.2020

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1. Introduction

The State of the Art report is the first activity to be performed by the IMPROVE project's partners within the Exchange of Experiences work package.

The objective of the State of the Art report is to clarify the current situation in terms of management and implementation of Structural Funds, with a special focus on the policy instruments selected by each partner.

In that respect, within the IMPROVE project the North-West Regional Development Agency has chosen Priority Axis 1 of the Regional Operational Program 2014-2020 funded through ERDF as the policy instrument to improve.

2. Regional profile

The North-West Region, also known as Northern Transylvania, is composed of 6 counties (Bihor, Bistrița-Năsăud, Cluj, Maramureș, Satu-Mare, and Sălaj) comprising 15 cities, 28 towns, 403 communes and 1,800 villages. It has a surface of 34,160 km^2 (14.3% of the country) and, according to Eurostat (2019), in 2018 had a population of 2,560,822 inhabitants. The region is bordering Hungary in the West and the Ukraine in the North. It is a multi-ethnic and multicultural region consisting of a Romanian majority, along with Hungarian, German, Roma and other minorities. The North-West Development Region is one of the least developed regions in the European Union, with GDP per capita (PPS) which was equal to 61% of the EU28 average in 2018.

Figure 1. Geographical position of North-West Region

Source: North-West Regional Development Agency

According to the Regional Competitiveness Index, in 2019 the North-West Region has ranked 246th out of 268 European regions, being the 3rd most competitive region out of eight at national level. According to Eurostat, in 2018, the region recorded a GDP value of 24,948 million Euros, representing 12.19% of the total national GDP. In 2017, the Gross Added Value (GVA) in the North-West region represented 20.769 million Euros, 12.2% of the value registered at national level. The GVA for industry represented approximately 28.62% of the total value of this indicator at regional level.

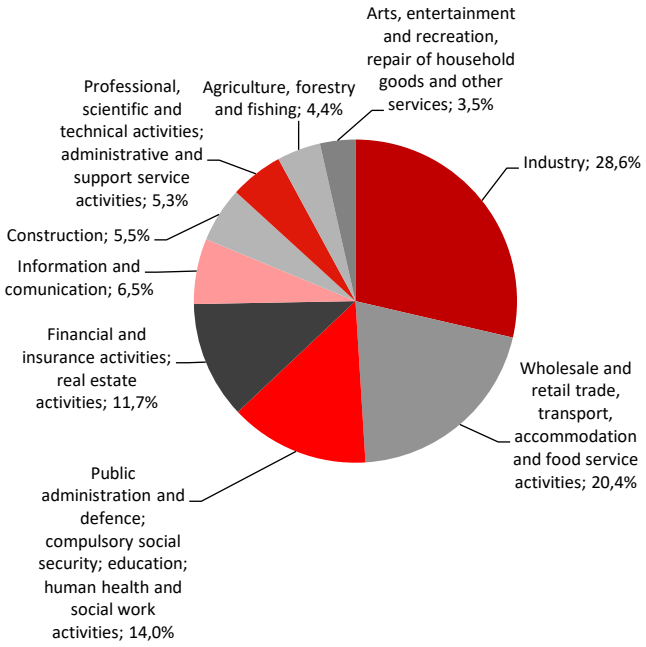

Figure 2. Distribution of GVA per sectors in North-West Region, 2017

Source: Eurostat, 2020

Regional Benchmarking

The regions with which the North-West Region from Romania shares similar and relevant structural conditions (social, economic, technological, institutional and geographical characteristics that influence the evolution of economic development based on innovation) have been identified based on the methodology developed by the Basque Institute for Competitiveness, considering the following types of indicators:

- Geo-demographic
- The level of education of human resources
- Technological specialization
- Sectoral structure
- Companies structure
- Degree of economic openness
- Institutions and values

According to an analysis based on the indicators mentioned above, the reference regions, in descending order of similarity are the following:

- Lubelskie - POLAND
- Lodzkie - POLAND
- Kujawsko - Pomorskie - POLAND

- Warminsko - Mazurskie - POLAND
- Podlaskie - POLAND
- Dél-Dunántúl - HUNGARY
- Dél-Alföld - HUNGARY
- Severozapaden - BULGARIA
- Yugoiztochen - BULGARIA
- Lubuskie - POLAND

In 2014, the GDP for the North-West Region amounted to 13,400 PPS/inhabitant, representing 100.26% of the average of the 11 regions and 48% of the EU28 average. In 2018, this indicator reached the value of 18,900 PPS/inhabitant, representing 119.3% of the average of the same regions. Although the indicator has increased significantly in recent years, regional GDP/capita remains at only 61% of the EU28 average, placing the North-West Region in the category of less developed regions (<75% of the EU28 average).

From the point of view of research and development expenditures as a percentage of GDP, the region registered a significant decrease in the period 2014-2017, holding the last place compared to the analysed regions with only 0.24% in 2017. Also, in terms of the share of people with tertiary education working in science and technology within the total active population, the North-West Region has the lowest value for the entire 2014-2019 period in comparison to the reference regions. The share of staff working in the field of research and development within the total active population during 2014-2017 also decreased by 0.02 pp., reaching the value of 0.266%, thus ranking 11th out of 11 analysed regions.

Despite the growth of GDP per capita in recent years, the growth rate of the level of material well-being in the region has been slower, the net disposable income of private households calculated in PPS/capita increasing by only 23.38% between 2014 and2017 (GDP growth for the same period being 33.84%). From the point of view of this indicator, in the last analysed year, the North-West Region ranked 9th out of 11 with 95% of the average of the analysed regions.

According to the net growth of the number of enterprises in 2017, the North-West Region was on the 4th position with a net growth of 4.31%.

Year / Place	2014	2015	2016	2017	2018	2019	Unit of measurement	Δ in analysed period
GDP/inhabitant	13,000 (VI)	13,700 (V)	15,200 (IV)	17,400 (II)	18,500 (II)	-	PPS/inhabitant	+ 41.04 % (I)
Disposable income of private households	7,700 (IX)	8,400 (IX)	9,400 (VIII)	9,500 (IX)	-	-	PPS/inhabitant	+ 23.38% (I)

R&D expenditure	0.27 (VIII)	0.41 (VIII)	0.25 (X)	0.24 (XI)	-	-	% of GDP	- 0.03 pp (VIII)
Total R&D personnel	0.286 (IX)	0.272 (X)	0.264 (XI)	0.266 (XI)	-	-	% of active population	- 0.02 pp (X)
Persons with tertiary education and/or employed in science or technology	22.2 (XI)	26.7 (XI)	25.9 (XI)	25.0 (XI)	26.0 (XI)	26.9 (XI)	% of active population	+ 4.7 pp (III)

Table 1. Positioning of the North-West Region in comparison with the reference regions according to the mentioned indicators.

Source: Eurostat, 2020

Entrepreneurial dynamics

In 2018 the North-West Region registered the second largest number of active enterprises[1] in the country, after the Bucharest-Ilfov Region. In the same year there have been 88,026 active registered companies in the North-West Region, representing 14.88% of the number enterprises registered at national level.

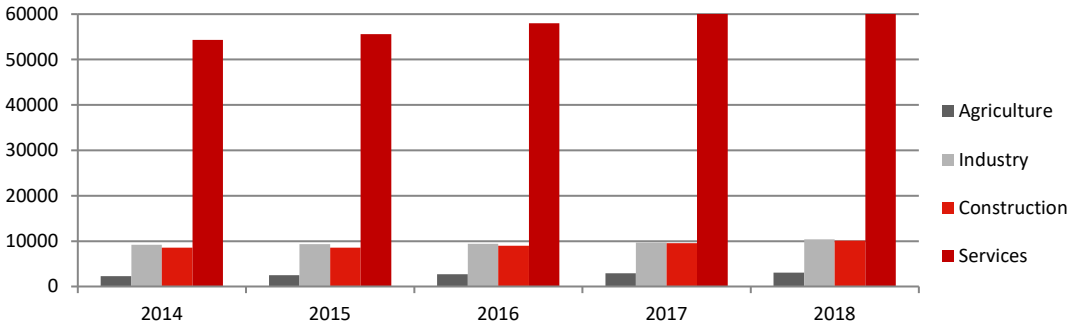

Figure 3. Evolution of the number of enterprises in North-West Region by economic activities, 2014-2018

Source: INS, Tempo Online, 2020

In the 2014-2018 period, the number of active companies has increased by 15% in the region, the increase being largely due to the development policies applied in the field. The sectors which had the highest growth were: Health (+64%), Entertainment, cultural and recreational activities (+55%), Education (+54%), IT (+32%) and Transport and storage (+21%). At the same time, two sectors registered a decrease in the analysed period: Production and supply of electricity and heat, gas, hot water and air conditioning (-17%) and the Extractive Industry (-9.6%).

[1] In Romania the National Statistics Institute publishes data related to companies under the name "Local units", which are enterprises or parts of enterprises (workshop, factory, warehouse, office, mine or station etc.) situated in a geographically identified place. In the present study, when referring to the number of active companies, we are referring to Active Local Units

Regarding to the size of enterprises, in 2018, the number of micro-enterprises (0-9 employees) represented 89.31% of the total active enterprises in the region, small enterprises (10-49 employees) 8.94%, medium enterprises (50-249 employees) accounted for 1.49%, while the rate of large enterprises was a mere 0.25%, with an increase of 10.3% during the 2014-2018 period.

Regarding the density of small and medium enterprises (SMEs), in 2018, the Northern Transylvania has ranked second out of eight in the national hierarchy, with 33.44 SMEs / 1000 inhabitants, above the national average of 29.43 SMEs / 1000 inhabitants. According to the EU Annual Report on SMEs 2018/2019, the value of this indicator places Romania on one of the last place at EU-28 level, well below the average value of 58 SMEs / 1000 inhabitants. Even if the general economic conditions in which SMEs operate have improved, there are still several key challenges that companies in Romania have to overcome, such as: finding customers, access to finance, availability of qualified staff and experienced managers.

The average rate of innovative companies in the region has registered a drastic decrease 27% in the 2004-2010 period, to 9.13% between 2012 and 2014. From 2014 to 2016 we could witness a slight improvement in this sense, their share reaching 13.2%. The rate of innovative companies is slightly higher among large enterprises, but the values show a decreasing trend (17.9% in 2016, decreasing from 28.9% in 2014 and 60% in 2008). On the other hand, we can see an improvement in the value of this indicator among small enterprises in the analysed period (14.1%, almost double of the value recorded in 2012 to 2014, 7.3%). The share of companies that introduced process innovations on the other hand has steadily increased in the analysed period, from 20% between 2012 and 2014 to 25.9% in the 2014-2016 period. The same situation can be found when analysing enterprises introducing product and/or process innovation, with an increase from 154 to 274 during the 2012 to 2016 period, remaining however well below the level registered in 2006 when 909 such enterprises were registered.

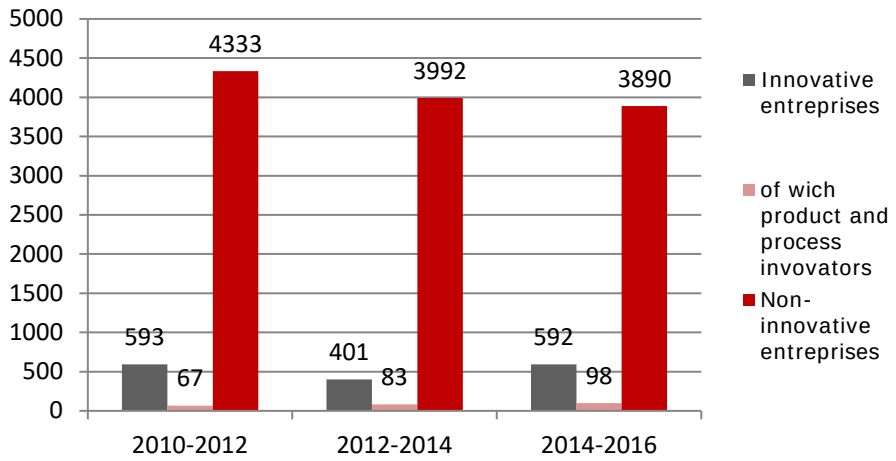

Figure 4. Evolution of innovative and non-innovative enterprises in North-West Region, 2010-2016

Source: National Statistics Institute

The number of newly created enterprises has shown an increase in the 2014-2019 period by 26.25%, with the highest values in 2017 (22,999 registrations), mostly due to the Start-up Nation Programme of the Romanian Government. The evolution is strongly influenced by the availability of funding sources from the national or EU budget, intended to support the establishment of new / start-up companies.

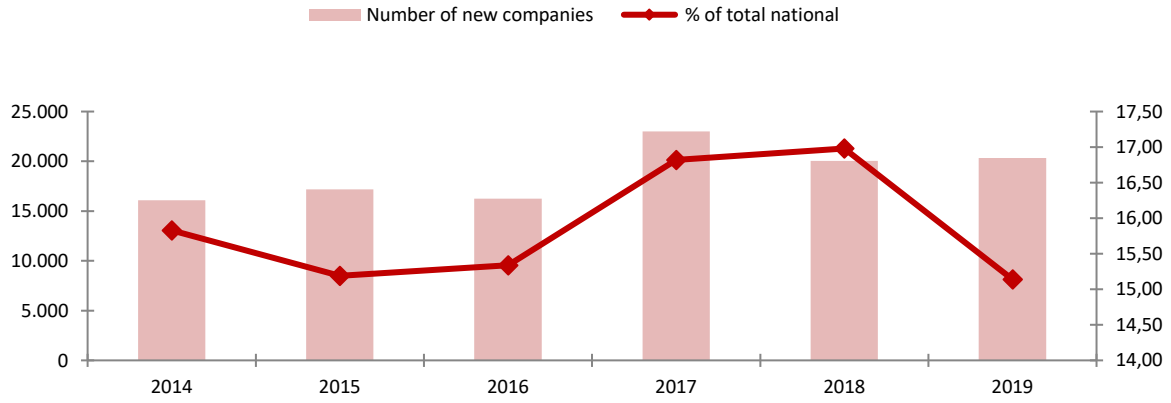

Figure 5. Evolution of the number of new companies in North-West Region and their share from the national total, 2014-2019

Source: National Trade Register, 2020

Between 2017 and 2018, the number of newly established enterprises in the region has decreased, showing however an increase in the share of the national total. Thus, in the North-West Region there was a slightly smaller decrease in the number of newly established enterprises than at national level. This decrease can mainly be attributed to the instability of the fiscal legislation in the first quarter of 2018, the business environment being obliged to implement 217 new regulations that amended Law no. 227/2015. From 2018 to 2019, the number of newly created enterprises remained relatively constant (+ 1.4%), but there is a slight decrease in the region`s share of the total national (-1.84 pp).

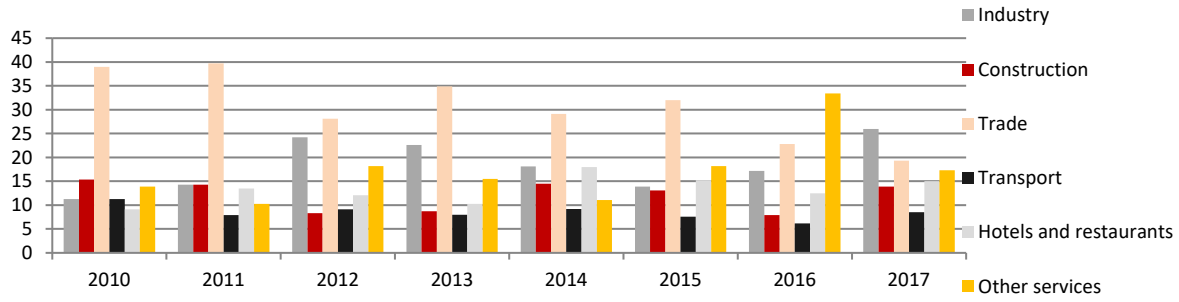

Figure 6. Start-up distribution in the North-West Region by economic sectors 2014-2017

Source: INS, Tempo Online, 2020

In the North-West Region, most of the newly created active enterprises were found in urban areas (69.5%), carrying out their activity mainly in industry (26%) and trade (19.3%).

The supply-side challenges faced by start-ups are: lack of resources (72.2%), limited access to credit (28.2%), lack of customers or late paying customers (38.1%), limited access for well-trained employees (46.3%), lack of technology (23.2%) and lack of raw materials (14.6%). Compared to 2013, there is an increase in difficulties such as limited access to well-paid employees (from 27.3% to 46.3%), lack of technology (from 13.9% to 23.2%) and lack of raw materials (from 6.2% to 14.6%). The newly created companies consider that their activity is hindered by the very high competition, by the lack of sufficient funds of the clients, and to the difficulties of becoming known in the absence of intense marketing activities.

Clusters and associations

The establishment of clusters at regional level has been initiated by the North-West RDA, including the facilitation of financial support by attracting non-reimbursable funds, as part of the implementation of the Regional Innovation Strategy of the North-West Region 2007-2013. At the initiative of the North-West RDA, clusters were established in the fields of ICT, furniture and renewable energies.

Most of the clusters in the region were created according to the classic triple-helix model, the core being represented by the association of companies joined by research and education institutes, as well as public authorities that come to support these structures and bring more visibility and lobbying power. In recent years, in line with international trends, the types of actors have been complemented in most of these structures, gradually moving to a quadruple helix format through the increasing involvement of civil society.

The active clusters in the North-West Region in 2019 were the following:

- Cluj IT Cluster established in 2012, acquiring the SILVER label from the European Secretariat for Cluster Analysis (ESCA) during 2016.
- Transylvanian Renewable Energy Cluster TREC, acquiring legal personality only in 2015 under the name Transylvania Energy Cluster. The cluster received the SILVER certificate from ESCA in 2018.
- The Transylvanian Furniture Cluster established in 2013, developing continuously to obtain the ESCA GOLD certificate in 2017.
- AgroTransilvania Cluster established in 2013 at the initiative of Cluj County Council, the cluster brings together actors from the food industry throughout the value chain. In 2019 the cluster obtained the GOLD label from ESCA.
- Transilvania IT Cluster by ARIES T established in 2013 as a human resources training cluster in the field of advanced technologies, and in the meantime has expanded its activity by offering support services for innovation, internationalization, etc. The cluster obtained the GOLD certificate from ESCA in 2018.

The clusters presented above are the most developed and active in the region, but without a very high territorial representation. Apart from the Transylvanian Furniture Cluster, which covers the counties of

Cluj, Bistrița-Năsăud and Maramureș, all the others are mainly concentrated in Cluj County and especially in Cluj-Napoca. The Cluj IT cluster also has some members from outside the region.

Other clusters from the region are:

- Transylvania Creative Industries Cluster.
- CLEMS - Eco-innovative cluster for a Sustainable Environment
- HOLZBOX – cluster dedicated to wood working and processing
- ADMATECH – Advanced Materials, Advanced- and Nano-technologies Cluster
- Transylvania Tourism Cluster
- Romanian New Materials Cluster
- „Transilvania Nord-Vest" - Regional Balneoturistic Cluster
- Transylvania Lifestyle and Transylvanian Tastes Clusters
- Geothermal Cluster from Oradea – currently not functional
- CLUSTHERM Transylvania - Cluster for the valorization of geothermal, sulphurous and salt-water resources

Even though the number of clusters in the region has been continuously increasing, out of a total of 76 clusters mentioned at national level according to the Ministry of Economy and Business Environment as well as in the statistics of the CLUSTERO (Romanian Cluster Association), only 8 are from the North-West Region.

At the end of 2019, the regional clusters which are also members in the Romanian Cluster Association have totalled: 348 enterprises, over 32,000 employees and accumulated 7.59 billion RON turnover, 769 million EUR exports, reporting research and development expenditures of 117 million RON. The increase in numbers compared to the year 2013 varies between 43% for exports and 169% for the number of employees.

Important fact is that many clusters in our region are mature clusters, with a relatively large number of members, with well-structured development plans and innovation strategies, recognized at European level by the European Secretariat for Cluster Analysis (ESCA). All three GOLD label clusters in Romania are from the North-West Region (Transylvanian Furniture Cluster, Transilvania IT Cluster and Agro Transilvania Cluster), the best performance for South East Europe.

In Romania there are three Digital Innovation Hubs (DiHs) that cover different domains (agriculture, textiles, machinery and equipment). Two of them are located in the North-West Region, formed around two ICT clusters - Cluj IT Cluster and Transilvania IT Cluster.

Foreign trade and foreign direct investments

In 2018 North-West Region has held fifth place out of eight regions at national level according to the value of exports. In recent years there has been a growing trend for exports, the highest values being recorded in the following areas and types of goods: machinery, equipment ("electrical machinery,

appliances and equipment"), furniture ("miscellaneous goods and products"), metal ("base metals and metal products"). Also, in the 2014 - 2018 period, the largest increases were registered in the case of exports related to various instruments (optical, photographic, cinematographic, medical-surgical instruments and machines; watches; musical instruments) - increase by more than 1.7 times, vehicles and transport materials (114% increase) as well as paper products (100% increase). The region registers a trade surplus for the following groups of goods: furniture and wood ("miscellaneous goods and products", "wood, charcoal and articles of wood"), footwear ("footwear, hats, umbrellas and similar articles"), agri-food products ("animal or vegetable fats and oils"). The largest exporters are in the field of furniture, electrical equipment, metallurgy, leather and footwear, which indicates a certain degree of regional specialization in those domains.

The specialization of a region in a specific sector based on export data can be measured by the "revealed comparative advantage" (RCA) indicator. The products with the highest value and in which the indicator remained above 1 throughout the analysed period (2014-2018) are: "Plastics, rubber and products", "Miscellaneous goods and products" (with emphasis on furniture) and "Footwear, hats, umbrellas and similar articles". In this group of products "Footwear and accessories" has the largest contribution to the formation of comparative advantage, given that much of the production is export-oriented. High values and a constant increase can also be observed in the case of group X. "Paper and paper based articles". As we can see, the groups of goods which register positive values in the analysed period are mainly labour-intensive. However, the situation is counter-balanced by the technology-intensive group (group XVI "Electrical machinery, devices and equipment; sound and image recording or reproducing devices") which gives a clear comparative advantage (although declining) for the North-West Region.

In 2019 the North-West Development Region has ranked 3rd out of eight regions in Romania according to the value of capital in companies and the number of companies with foreign capital. In 2018, the value of foreign direct investments (FDI) was 4,610 million Euros, representing 5.7% of the national FDI. Compared to the reference year, 2014, the foreign direct investments in the region have increased by approximately 36.23%, well above the national growth rate (34.76%).

The North-West Region has accounted for a share of only 6.1% of the total value of greenfield investments registered at national level in 2018 (51,150 million Euros). Regarding the share of the country's total FDI, the North-West Region holds a stable 5th place at national level during the entire 2008- 2018 period, attracting by the end of 2018 5.7% of the total FDI in Romania

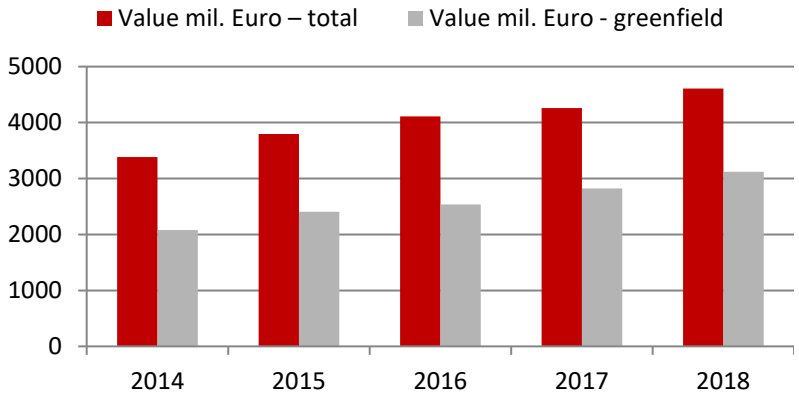

Figure 7. Evolution of foreign direct investments, 2014-2018

Source: INS, Tempo Online, 2020

Labour resources

According to the National Statistics Institute, in 2018, the number of employees in the North-West Region was 691,451 people, representing 13.64% of the total number of employees in Romania, the share remaining relatively constant in the 2014-2018 period. The share of men in the total number of employees has represented 52.90%.

In 2018, at regional level most employees were registered in industry (32.07%) followed by trade (16.49%). The analysis of the regional economy by activities shows that the manufacturing industry occupies an important share in employment (217,304). In recent years, the number of employees has increased significantly in the ICT, services and cultural and creative industries sectors, showing an increase in the importance of these areas in the regional economy.

In general, branches with a high number of employees tend to have low technological intensity, requiring rather large share of human capital, with the exception of the road transport vehicles and rubber products industries. The branches of the manufacturing industry which concentrated the largest number of employees in the North-West Region in 2018 are:

- Manufacture of road transport vehicles, trailers and semi-trailers - 27,981;
- Manufacture of furniture - 23,877;
- Food industry - 23,210;
- Tanning and finishing of leathers; manufacture leather goods, harnesses and footwear; fur preparation and dyeing - 19.132;
- Manufacture of wearing apparel - 16.191;
- Industry of metal constructions and metal products, excluding machinery, equipment and installations - 15,682.

The number of people employed in technology-intensive fields and in knowledge-intensive services in the North-West Region was in 2018, according to Eurostat, 352,400, increasing by approximately 2.6% compared to 2014. The share of employees working in technology fields at regional level remains slightly below the national average (17.9% in comparison to 18%), placing the region in 2nd place in the national hierarchy, after Bucharest-Ilfov.

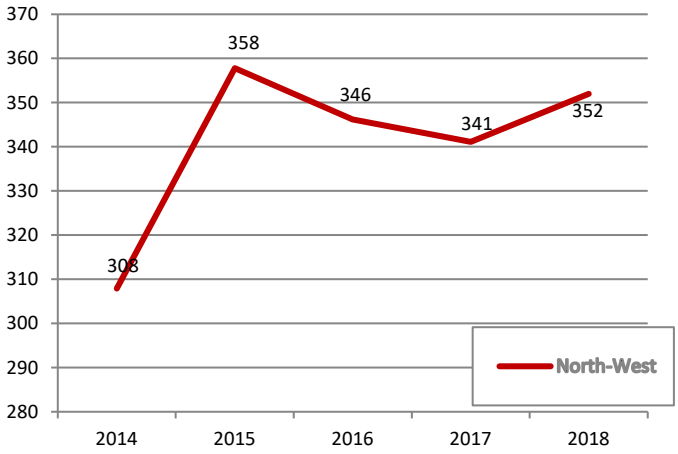

Figure 8. Number of employees in HRST 2014-2018 (thousands of persons)

Source: Eurostat

The number of researchers and engineers employed in fields of HRST was, in 2018, 250,000 people, ranking 2nd at national level, with an increase of 39,000 compared to 2014. The situation is still similar to that of other European regions, such as the Mittelfranken Region (Germany), the Aquitaine Region (France) or even Vienna (Austria), which have the same share of researchers and engineers, according to Eurostat. Compared to the reference regions mentioned in the regional benchmarking, in Northern Transylvania there has a significantly higher number of researchers and engineers than some of the partner regions from Poland (except Lodzkie, Pomorskie), Hungary or Bulgaria.

The rate of participation in lifelong learning among adults is very low in Romania (1.2% in 2019, down from 1.5% in 2014), according to the Eurostat database. The participation rate in courses and trainings was, in 2018, 0.9% at regional level, below the national (1.5%) and European (10.7%) averages, despite the generous number of providers of such courses.

The university system and tertiary education in relation to the labour market

The region stands out both nationally and in comparison with other regions from Central and Eastern Europe, in terms of the number of higher education institutions (especially public) and specializations offered. According to the National Statistics Institute, in 2018, the region has ranked second in the national context, after Bucharest-Ilfov, in terms of the number of universities (13). There are 7 public universities in the North-West Region, out of 55 nationally, and 6 private universities, out of 37 existing in the country.

Based on statistical data provided by the National Statistics Institute, in 2018, there were 90 faculties in the region out of the 545 at national level, the first place being held by the Bucharest-Ilfov Region with 159. The faculties in the region are quite unequally distributed among the counties, most of them being in Cluj (49) and Bihor (22) counties. Out of 406 faculties - public property existing at national level, in the North-West Region there are 70, compared to 95 in the Bucharest-Ilfov region.

In absolute values, the North-West Region has registered in 2019, 364 thousand people with a university degree or which work in the field of science and technology (signalling an increase of 18.5% compared to 2014). Compared to the active population, 26.9% has graduated from tertiary studies and / or work in the field of science and technology, positioning the region above the national average (26.4), but well below the values of the Bucharest-Ilfov region (53.7%).

Regarding the educational supply, it is important to analyse the link between education and the demand for jobs on the market. In the North-West Region, in 2018, there were 27,652 registered unemployed people, with 0.08% less than in 2014 and much less than in other development regions of Romania.

On average by quarters for 2019, the most vacancies were registered in the field of business and economy 5,815 (15.90% of the national total in this field), thus placing the region on the 2nd place after the Bucharest-Ilfov region. On the other hand, the industry sector ranks first in terms of the share of vacancies, with a value of 20.83% of the total vacancies available at national level (3,126 vacancies).

Business support infrastructures

In the North-West Region the most visible business support infrastructures are industrial parks, out of 90 existing at national level, a number of 21 are found in the North-West Development Region. The 21 industrial parks cover a total area of over 765 hectares and host over 240 economic operators, at the beginning of 2020, seven were at in the stage of development without hosting any economic operator. Out of 21 industrial parks mentioned, 6 are located in rural area, and the rest 15 are located in urban area.

At the present moment, there are no functional Science and Technology Parks (STPs) in the North-West Region. However, in the current programming period there is an approved project within the ROP, Axis 1., Operation 1.1.B - Science and Technology Parks for the construction of the Bihor STP, an initiative of the Bihor County Council together with Bihor Industrial Parks and the University of Oradea. The total value of the project amounts to approximately 7 million euros.

Regarding business incubators, in the 2007-2013 programming period several such structures have been financed through the Regional Operational Programme. In 2020 however, none of these have been documented as functional. On the other hand, there are more and more private initiatives regarding related to business support infrastructures, some even without non-reimbursable funding. One of the oldest incubators in the region operates within the Tetarom 1 industrial park in Cluj, which at the end of 2019 hosted 10 companies with a total number of 53 employees. According to the information provided

by TETAROM representatives, there are plans to expand the incubator with another building financed by European Funds. In recent years, in terms of business support structures, we can see an exponential increase in the number of new generation structures, such as co-working offices, various business hubs, accelerators, etc. This trend indicates a growing interest in collaboration by young entrepreneurs, especially in the high-tech sectors, thus contributing to the acceleration of spill-over effects and the exchange of information between innovative start-ups. Most of them are found in Cluj County, generally supporting collaboration between new companies and start-ups, having a strong IT component. However, lately, structures with an emphasis on specific areas have begun to appear. Without claiming to give an exhaustive list, among the initiatives of this kind we can mention: Cluj Hub (Cluj), Cluj Cowork (Cluj), thatdevspace (Cluj), Chaos Cowork (Cluj), Zain Studio (Cluj), Coworking Oradea (Bihor), Oradea Tech Hub (Bihor), Work Baia Mare (Maramureş) or Creative Minds Hub Zalău (Sălaj).

The list of coworking locations is completed by business accelerators, their mission being to improve the ecosystem of startups, helping them to grow rapidly in the international branch. The most developed program in the region is offered by Spherik Accelerator from Cluj-Napoca, awarded several times for the best acceleration program in Romania. The list is completed by other initiatives, most of them from Cluj (Techcelerator, Risky Business, Hubcelerator).

Regional research and innovation, in national and European context

From the PoV of RDI, the North-West Region largely follows the national trends, managing to hold up to the European standards only through the significant number of scientific publications, the overall performance in terms of innovation being continuously declining, placing the region on the last places in the ranking of European regions. From a national point of view, the region distinguishes itself by the large number research and development institutions and their high value of total RDI expenditure (current and capital).

Compared to the reference regions, the RD expenditures per capita place the region in the last place. To exemplify, the Pomorskie (129.2 Euro per capita) and Dolnoslaskie (124.4 Euro per capita) regions of Poland and the Dél-Alföld region (98.3 Euro per capita) in Hungary, allocate significantly higher amounts to research activities compared to the North-West Region (21.1 Euro per inhabitant).

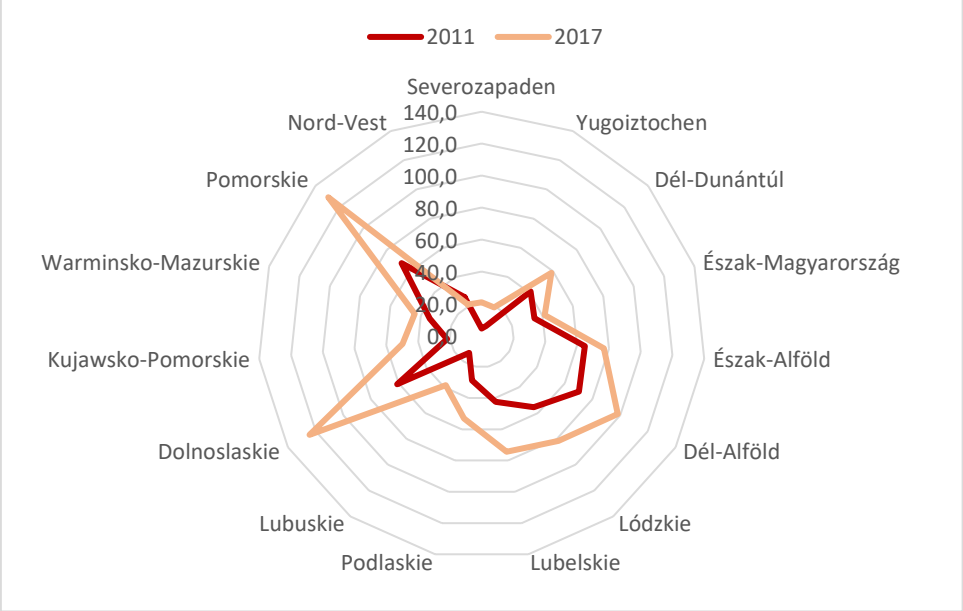

Figure 9. R&D expenditure per capita in the North-West Region and European reference regions in 2017 compared to 2011 [euro]

Source: Eurostat 2020

Regional research and development profile

In the North-West Region there are 24 public research and development institutes, out of a total of 263 at national level. In addition, the region has 107 companies whose main activity is in the field of research and development.

The research activities of most RDI companies in the region (73%) are related to natural sciences and engineering (78 units), followed by research and development in social sciences and humanities (18 units) and research and development in biotechnologies (11 units). All 107 RD entities in the North-West Region are assimilated to SMEs, 88% having less than 10 employees and only 3 of them having more than 50 employees.

In the 2013 to 2017 period, it appears that higher education institutions had the most intense RDI activity (almost 50% of R&D expenditures in the region), followed by the private sector (by 29%) and the public sector (by 23%).

Patenting and publishing the results of scientific research

According to the latest data provided by the European Patent Office (EPO), in 2019 the number of patent applications registered by Romanian organizations has amounted to 40, out of a total of 68,877 at EU28 level. The number of patents granted in the North-West region is 10 in the analysed period. Regarding the patent applications to the State Office for Inventions and Trademark (OSIM), in 2018, 129 applications were submitted by organizations from the North-West Region, representing 11.25% of the 1,147 applications filed at national level. Of the total applications submitted to OSIM, 31.65% have had patents issued, registering a slight decrease compared to 2014. In the 2014 - 2019 period, 213 patents were issued in the North-West Region.

From the analysis performed on the Official Bulletins of Industrial Property (BOPI) prepared monthly by the State Office for Inventions and Trademarks (OSIM) for the 2014 - 2019 period it has been found that:

- 34.74% of patents are the result of the activity of research teams within universities (UBB Cluj-Napoca, UTCN, University of Oradea, USAMV Cluj-Napoca and UMF Cluj-Napoca);
- 18.31% of patents represent the result of research activity in companies in the region (FARMEC SA, TEHNOMAG SA, CONVERGO SRL from Cluj County, ELECTRO SISTEM SRL from Maramureș County, RAAL SA from Bistrița-Năsăud County);
- 21.60% of the patents were obtained by researchers from research institutes (INCDTIM, IINOE-ICIA-CENTI, ICPT TEHNOMAG, ICPE BISTRIȚA, ONCOLOGICAL INSTITUTE „PROF. DR. ION CHIRICUȚĂ”)
- 25.35% of patents certify the innovative nature of devices made by individuals.

Among the patents obtained by entities in the North-West Region, most are found in the fields: machinery, appliances and equipment, electrical equipment, electronics, composite materials and materials, health, chemistry and food industry.

Human resources in RDI

According to the data from the National Statistics Institute, in 2018 in the North-West Region there were a total of 3,484 employees in organizations with RDI activity (of which 67% researchers) representing 7.79% of the total number of employees in Romania in this sector. The North-West Region ranks 5th in the national hierarchy in terms of this indicator.

In the same year, there were 29.5 employees from R&D activity per 10,000 persons occupied, the region ranking 3rd in the national hierarchy. At NUTS 3 level, Cluj County is in 6th place in the national hierarchy (with 90.5 RDI employees / 10,000 inhabitants), an aspect that can be correlated with the presence of Cluj-Napoca, as a university centre in the county.

The number of full-time RDI employees (or equivalent) in the region was 1,964 in 2018 (representing only 6.1% of the national total). The vast majority are found in Cluj County (92%), followed by Bistrița-Năsăud County (4%).

In 2018, the number of researchers in the North-West Region was 2,334, representing 8.5% of the total number of researchers in Romania (27,471 researchers), the region ranking 4th in the national hierarchy after Bucharest-Ilfov (50.44 % of researchers in Romania), North-East and West. In the 2014-2018 period there was an increase of 18.96% in the number of researchers in the region, the number of technicians and assimilated staff remaining relatively constant.

Women represent 48% of the number of researchers in the region (2017), an indicator above the national average of 46.7% and well above the European average of 33.8% (2017).

The vast majority of researchers in the North-West Region work in Cluj County (2,206 researchers in 2018, representing 94.5% of researchers in the region). An important core of 1.41% of the total number are registered in Bistrița-Năsăud County. According to Eurostat, from the total number of researchers in the region (2,210 in 2017), the vast majority (70%) carried out their RDI activities within universities (1,550) and 20% in the public sector (461).

Between 2015 and 2017 there was a drastic decrease by 62% in the number of private researchers in the North-West Region from 459 to 174 researchers, the share of private researchers in the region falling with 8% below the national average, which is also decreasing (17.7%) and especially compared with the European Union (42.3%). Cumulatively, 77% of researchers in the region come from the public sector (government and public higher education) and 23% from the private sector (enterprises and the civil sphere).

Economic aspects related to RDI

At the level of the North-West Region, the total R&D expenditure has increased in the 2014-2018 period by 18%, reaching the value of 54.4 million euros. At the same time, the region has fallen in the national ranking, in 2018 occupying only the 5th position in front of the North-East, South-West Oltenia and South-East Regions, compared to the 2nd in 2015.

The evolution of total R&D expenditures as a share of GDP in the North-West Region indicates a low allocation for R&D activity at regional level, with an average of 0.27% per year of regional GDP in the 2014-2018 period. In the same period the national average was 0.41% of the GDP, while the EU28 average 2.12% of the GDP.

The value of RDI expenditure per inhabitant has fluctuated in recent years, the maximum value being 29.3 euros / inhabitant in 2015, in 2013 being 19.8 euros / inhabitant and in 2017 21.1 euros / inhabitant. This indicator places the region below the national average of 48.1 euro / inhabitant in 2017 and well

below the European average of 624.2 euro / inhabitant. At national level, the North-West Region ranks 3rd, after Bucharest-Ilfov Region (268.6 euros / inhabitant) and the West Region (38.9 euros / inhabitant).

Between 2013 and 2017, almost 50% of R&D expenditure in the North-West Region was recorded by higher education organizations, 29% by the private sector and 23% by the government sector. In Romania, most of the R&D expenditures are made by the government sector, with almost 40%, higher education financing less than 15% of R&D expenditures.

From the point of view of innovation spending, according to the latest data, in 2016 the North-West Region ranked 5th in the national hierarchy, ahead of the North-East, West and South-West Oltenia Regions. Innovation expenditure is divided into the following categories: (I) internal research and development activity, (II) external research and development activity, (III) procurement of machinery, equipment and software, (IV) acquisition of other external knowledge, and (V) expenses for other innovative activities.

The expenditures for innovation made by the innovative companies from the North-West Region have decreased by 67.31% in the 2012-2016 period, reaching the value of 17.157 million euro. In 2016, 83.8% of innovation spending in the region was concentrated on industry, in the services sector accounting for 16.2%.

The main financial support for RDI activities continues to be European and national grants.

The policy instrument

3.1. Overall description of the policy instrument

The 2014-2020 Regional Operational Programme (ROP) is the successor of the 2007-2013 Regional Operational Programme and is one of the programs providing access for local actors to European structural and investment funds. The ROP in general aims to promote smart sustainable and inclusive growth in all regions in Romania, making them more attractive places in which to live and work. The programme addresses the major development challenges for Romania: regional competitiveness, sustainable urban development, the low-carbon economy, and economic and social infrastructure at regional and local level.

The programme addresses the five national growth challenges identified in the Partnership Agreement:

- Competitiveness and local development,
- Population and social aspects,
- Infrastructure,
- Resources,
- Administration and governance.

Although the ROP has 12 priority axes in total, in the present document we focus only on Priority Axis 1. “Promoting technology transfer”, corresponding to Thematic Objective 1. ”Research, Technological Development and Innovation”, since it is this axis which has been selected as the Policy Instrument to be improved in the framework of the IMPROVE project.

Priority Axis 1. “Promoting technology transfer” of Regional Operational Program 2014-2020

The PA1 of ROP 2014-2020 is structured around a single Investment Priority (IP) 1.1. which will result in the attainment of 2 Specific Objectives (SO), namely:

■ SO 1.1. Increase of innovation in companies by supporting entities of innovation and technology transfer (EITT) in smart specialisation areas;

■ SO 1.2. Supporting smart specialisation in less developed regions, selected as pilot regions under ‘DG Regio’s Initiative for Less Developed Regions’;

IP 1.1. seeks to promote investments in R&I, the development of links and synergies between companies, research and development centres and the higher education, in particular to foster investments in product and service development, the technology transfer, the social innovation, the environmental innovation and public service applications, the stimulation of demand, the creation of networks and groups and of open innovation through smart specialisation, as well as to support technological and applicative research activities, pilot lines, early market acceptability testing of

products, advanced production and premium production capabilities, especially in the field of key enabling technologies and the diffusion of all-purpose technologies.

In terms of results expected from the implementation of PA1 under ROP 2014-2020, the innovation is necessary for Romania, both at national and development region level, in order for Romania to become / stay competitive by increasing the work productivity in companies, the access to new supply and dispatch markets, the development of higher value-added products and services and, finally, for creating sustainable jobs in a strong globalised competition.

Investments that are to be achieved under IP 1.1., aiming at reaching the two specific objectives (1.1. and 1.2), address the increase of economic competitiveness through technology transfer with a view to increase the share of innovative SMEs which are open to an approach based on collaboration and partnership.

In the light of ROP interventions as a tool for financing public policies in the field of regional development, the proposed goal can be achieved by creating and developing support entities for innovation and technology transfer, whether public or private, in the less developed regions of the country, in line with the principle of smart specialisation. These investments aim to support the achievement of a more intensive transfer of research results into innovative commercial applications, with an impact on taking over and dissemination of market research results, whilst also contributing to the growth of the technological progress diffusion rate on the market and in the society, this responding in general to the Europe 2020 Objective regarding the development of a knowledge and innovation-based economy.

The investments proposed through the operations under PI 1.1. seek to strengthen the specialisation resulted at local and regional level, in order to ensure an efficient valorisation of comparative advantages on grounds of natural resources and other favourable factors, and of the relative accessibility to markets and supply chains.

Under the IP 1.1., Specific Objective 1.1., a number of 3 calls for proposals have been organised by the reference evaluation date. The calls are the following, in the chronological order of their launch and considering the preliminary results with which they ended:

- **Competitive call under operation 1.1 C (Call code: POR/2017/1/1.1.C./1)** - Investments for SMEs with the view to implement the result of research and innovation in partnership with EITT - call open between 25 January - 25 August 2018. The applicants eligible under this call for projects were the legal entities established based on Law 31/1990 regarding the companies or cooperatives which fall into the category of SMEs1 (micro, small, medium-sized enterprises) in partnership with technology transfer entities accredited in accordance with the legal provisions in force. The minimum amount of the non-reimbursable funding applied for was set at the minimum threshold of EUR 25,000, converted into RON using the InforEuro exchange rate valid on the launch of the call for projects, respectively for December 2017. The amount of the

requested non-reimbursable financing could not exceed the de minimis ceiling (EUR 200,000 granted over the past three years).

- **Competitive call under operation 1.1 B (Call code: POR/2018/1/1.1.B./1)** – Supporting Scientific and Technology Parks - call open between 13 August 2018 and 13 April 2019. In this call, a number of funding applications were submitted and accepted in the selection process;

- **Competitive call under operation 1.1 A (POR/2018/1/1.1.A./1)** - Innovation and technology transfer infrastructure - call open between 20 August 2018 and 20 April 2019. In this call, a number of 30 funding applications were submitted, out of which 27 were accepted in the selection process;

- **The fourth call (POR/2018/1/1.1/OS 1.2/1)** addresses the Specific Objective 1.2 - Supporting smart specialization in less developed regions, selected as pilot regions under 'DG Regio's Initiative for Less Developed Regions'; the call has been launched early in 2020 with a submission deadline set for the 30th of My, 2020.

Except for the North-West Region, the allocated level of the non-reimbursable funds was not achieved through the submitted projects in any other region. In addition, even in the regions where a greater number of projects were submitted, many of them did not meet the eligibility criteria and were rejected, which makes the level of the granted allocations be actually even lower than the one presented in the table below:

Region	Total allocation on SO 1.1. [EUR]	Total allocation on SO 1.1. [RON]	Non-refundable amount of submitted projects [RON]	% value of submitted projects / Allocation on SO 1.1.
North-East	19,061.575	88,847.907	77,076.378	86.75%
South-East	16,176.757	75,401.482	35,915.911	47.63%
South - Muntenia	17,134.732	79,866.699	3,351.539	4.20%
South-West Oltenia	13,030.670	60,737.256	9,478.149	15.61%
West	12,812.949	59,722.437	30,318.144	50.77%
North-West	15,599.792	72,712.190	94,018.741	129.30%
Centre	15,044.602	70,124.394	26,861.142	38.30%
Bucharest - Ilfov	0	0	15,409.295	n/a
Total	**108,861.077**	**507,412.366**	**292,429.300**	**57.63%**

Table 2. PA1 - Financial allocation and value of submitted projects, per region

Source: SMIS and Decision MC ROP 96/2018, data valid on 14.05.2019

The regional distribution of submitted projects indicates that more than half of the total number of projects under Axis 1 were submitted in two regions only (39 projects in DR North-East and 27 projects in DR North-West).

REGION	1.1.C - SME - ITT partnership	1.1.A.- Support to ITT	1.1.B. - Scientific and Technology Parks - STP	Total	% in total
North-East	32	6	1	39	31,20%
Centre	19	4		23	18,3%
North-West	18	6	1	25	19,8%
South-West Oltenia	11	1		12	9,5%
South - Muntenia	7	4		11	8,7%
West	4	6		10	7,9%
South-East	3	3		6	4,8%
Total	**94**	**30**	**2**	**126**	**100.0%**

Table 3. PA1 – Numerical distribution of submitted projects by region

Source: Information from the RDA websites (April 2019)

Shortly, this axis was at the time of this evaluation in an early stage of implementation, in terms of achievement indicators and outcome indicators.

3.2. Design of the policy instrument

The Regional Operational Program (ROP) 2014-2020 was developed according to the European principle of subsidiarity, based on both the European and national regulations in the field, as well as other specific programmatic and strategic documents at European and national level.

The Regional Operational Program 2014-2020, is managed by the Ministry of Regional Development and Public Administration as Managing Authority, was adopted by the European Commission (EC) on June 23, 2015.

The main key actions that have been taken regarding the elaboration of Regional Operational Programme were:

- Establishing the priority axes and their connection with the Thematic Objectives and determining their budget within the programme;
- Decision of the approach and contribution of the regional programme, to the final integrated approach of the Partnership Agreement;
- Analysis of the possibilities of using the new tools proposed by the European Commission;
- Elaboration of the indicative list of major projects;

- Selection of areas of intervention within the priorities, for defining investment priorities, as well as defining clear and measurable targets for defined indicators;
- Defining the implementation details, starting from the difficulties that occurred in 2007-2013 period.

Certain investment priorities in the 2014-2020 period program period represented a continuation of the 2007-2013 interventions, but Axis 1. “Promoting technology transfer” was not one of these.

The selected Policy Instrument - Priority Axis 1. “Promoting technology transfer” of Regional Operational Programme 2014-2020 has been designed so that it would contribute to the implementation of RIS3 at regional level. The existence of a Smart Specialization Strategy has been set as an ex-ante conditionality by the European Commission in order for Member States to be able to access and use the ESIF for innovation and competitiveness. However, at the beginning of the 2014-2020 Programming Period, this ex-ante conditionality has only been fulfilled at national level, assimilating the National Research and Development Strategy with a Smart Specialization Strategy, the regions being given a free hand to develop their S3, being urged to follow the methodology developed by the European Commission. The North-West Regional Development Region in Romania has been among the last regions to start developing its own S3, being also included meanwhile within the Lagging Regions Initiative of DG Regio, receiving support from the JRC in elaborating the final version of the document and organizing the Entrepreneurial Discovery Process.

Meanwhile, on the verge of launching the first calls within the Priority Axis 1 of the ROP, given the significant differences in the Smart Specialization Strategies the Romanian regions, the ROM MA has instructed all regions to elaborate a so-called Framework Document (also called “Regional Concept Note”) for the implementation of Priority Axis 1 of the ROP, according to a standard format common for all regions. As a result, the elaboration of the S3 and the Framework Document have ended up being parallel processes, one respecting the JRC methodology, the other being elaborated according to the instructions of the MA. The Regional Framework Document was endorsed by the Regional Innovation Consortium in 2017, while the Regional Smart Specialization Strategy was approved by the Steering Committee at the end of the same year, the approval of the Regional Development Board being achieved in early 2019.

The Smart Specialization Strategy of the North-West Development Region has been developed in accordance with the RIS3 Guide developed by DG Regio and Urban Policy. An extremely important step in the process of strategy`s elaboration was the inclusion of the Region in the project “RIS3 for less developed regions” implemented by the Joint Research Centre (JRC) of the European Commission, under the coordination DG Regio and Urban Policy and with the financial support of the European Parliament. One of the most important aspects of the support received was the operationalization of the Entrepreneurial Discovery Process (EDP), a key element not only of the development process but also of implementation of smart specialization strategies. With the help of European Commission experts

process was organized according to a methodology that ensured the achievement of optimal results, from the perspective of selecting areas of specialization, supporting and developing the interaction of key actors in the quadruple helix system, generating and developing quality project ideas that can contribute to achieving regional specialization objectives.

RIS3 is the result of a bottom-up process, which involved extensive consultation with regional actors involved in priority areas of activity (in which the region benefits from competitive and / or comparative advantages). This consultation process was accompanied by a process of entrepreneurial discovery (EDP), embodied in a portfolio of project ideas. The construction of the portfolio was and is a transparent process in which the key actors from the quadruple helix system were involved, facilitating cooperation and partnership between different types of actors, taking into account the methodological aspects promoted by the EC. Mostly the final portfolio is the result of a bottom-up approach and to a lesser extent a top-down approach, with most projects being generated in the EDP workshops, starting from the needs, challenges and barriers identified by the key actors.

The construction of the RIS3 project portfolio was a transparent process in both regions, involving key actors from the quadruple helix system (central and local administration, educational institutions, education and research entities, business representatives, SMEs, entrepreneurs, investors, civil society, etc.), being promoted, especially in entrepreneurial discovery workshops, cooperation and partnership between different types of actors, taking into account the methodological aspects promoted by the European Commission.

3.3. Policy mix ingredients

General objective: Reducing the fragmentation of the innovation chain through effective cooperation between the research and development sphere and the productive system, respectively through the “intelligent” development of the support infrastructure, human resources and the mobilization of private capital.

Innovation is needed to increase competitiveness, to increase productivity, to enter new markets, but also to adapt to a constantly changing economic environment, as well as to contribute to economic growth and job creation. At the same time, it can help to address the most pressing needs of society.

Innovation in this sense means connecting knowledge and technology with the needs and opportunities of the market, in order to create new products, processes, practices, methods (organization, marketing) or substantially improved new services. This implies entrepreneurship, risk-taking, but also functional innovation ecosystems in which there is an effective and efficient cooperation between the research and development sphere and the business environment.

PRIORITY 1 - The "tripod" for research-development-innovation adapted to market needs

Specific objective: Increasing research-development-innovation capacity and adapting technology transfer services to market needs.

Actions:

1.1 Development of the regional research infrastructure and human resources involved in research activity

- investments in public and private research institutes / centers / laboratories to carry out research, development and testing activities, purchase of new equipment and tools, in order to bring research results to a higher TRL level;
- promoting cooperation between research-development-innovation entities for the purpose of sharing research infrastructures;
- ensuring researchers' access to the latest information regarding technological developments;
- orientation towards new research fields, especially towards Key Enabling Technologies as well as the accreditation of KETs laboratories;
- development of human resources involved in RDI, promoting multi-disciplinary research and researcher mobility;

1.2 Development of innovation infrastructures and offered services

- development of science and technology parks, technology- and competence centers - through construction, modernization, extension and endowment with necessary equipment and software, facilitating the creation of links between businesses and academia;
- developing of a range of services combining the offer of research infrastructure (space, equipment) with business support services in order to facilitate innovation (intellectual property management, financial services, marketing, etc.);
- increasing the capacity of human resources to provide specific services for research and innovation;
- procurement of specific services, including business consulting;

1.3 Development of technology transfer infrastructures and diversification of transfer services

- investments in existing innovation and technology transfer entities and the creation and accreditation of new entities in order to commercialize the results of research and development (tests, prototyping, etc.) through construction, modernization, expansion and endowment with necessary equipment and software;
- development of new types of infrastructures that facilitate technology transfer (eg. demo-lab, living lab, fab lab, makers-space, etc.);
- development of infrastructures (physical and digital) that facilitate the interaction between RDI and the business environment regarding technology transfer;
- development of new types of technology transfer services closely correlated with the needs of the business environment;

- development of human resources involved in providing technology transfer services
- procurement of specific services, including business consulting;

PRIORITY 2 - An innovative and digitized business environment

Specific objective: The increase of the number of innovative enterprises, including by aligning with Industry 4.0 standards and by private capital invested in RDI.

Actions:

2.1 Supporting innovation within companies in the fields of smart specialization

- support services for the business environment: supporting internationalization, B2B events, matchmaking, innovation audits, etc.;
- support for the procurement of technology transfer services specific to companies' needs;
- encouraging RDI activities within companies, investments in private RDI;
- promoting the acquisition of new technologies, including investments in energy efficiency, sustainable use of resources, eco-innovation measures;
- increasing cooperation between companies from different sectors;
- increase the absorption capacity of available public funds, especially Horizon 2020 - SME Instrument;
- internship programs in innovative companies;

2.2 Mobilization of private capital to support RDI

- establishing venture capital funds and business angel networks;
- more efficient use of financial instruments available at national and European level by the business environment;
- boosting domestic private investments in start-ups and spin-offs;
- attracting foreign direct investments in areas of smart specialization;
- promoting public-private partnerships in the fields of smart specialization;
- creating platforms to promote innovative ideas and regional assets dedicated to potential foreign investors;

2.3 Digitization of the business environment in areas of smart specialization

- promoting the use of digital technologies in companies in order to increase visibility (web pages, online marketing);
- facilitating the use of digital technologies for increasing productivity (production lines, automation, robotics, digital technologies in management, organization of activities, etc.);

2.4 Human resources development in areas of smart specialization

- correlating the educational offer with the market demand in the fields of smart specialization;

- increasing the number of employees in the fields related to STEM or HRST;
- development of schemes for placing researchers in enterprises;
- increasing the level of digital literacy of employees and providing specialized support services in smart specialization sectors (accounting, legal aid, etc.);

2.5 Creation of new, innovative enterprises

- supporting the creation of innovative start-ups and spin-offs;
- developing the entrepreneurial spirit and skills in young people;
- development of business support infrastructures (business incubators, accelerators, hubs, etc.);

PRIORITY 3 - Cooperation networks

Specific objective: Streamlining regional, national and international cooperation between different actors in the innovation ecosystem.

Actions:

3.1 Facilitating the integration of relevant local actors into cooperation networks related to research, development, innovation and technology transfer

- setting up cooperation networks between R&D entities, innovation and technology transfer entities at regional level;
- supporting the cooperation between regional R&D institutions with similar entities at national and international level, especially the integration into European networks;

3.2 Streamlining cooperation between RDI and technology transfer organizations, respectively the business environment

- mechanisms and tools to facilitate interactions between the relevant entities;
- initiatives, actions and activities for facilitating the cooperation between the relevant actors;
- identifying key actors that can be involved in cooperation initiatives;
- publishing the offers for technology transfer services;

3.3 Facilitating the cooperation within the quadruple helix model

- supporting the development of existing clusters, in order to streamline and develop activities, but also to involve new members, especially from the business environment,;
- creation of new clusters in areas of smart specialization;
- supporting the interaction and cooperation between the public administration, the business environment, the research and development sphere and the civil society in order to generate projects and policies aimed at supporting the business environment;
- facilitating the interaction between the local / regional level and the central administration in order to correlate policies, strategies, public policy measures;
  creating mechanisms and tools to facilitate interaction between the relevant actors;

3.4. Map of the policy mix

Objectives	Dedicated Tools	Practices referenced in North-West Region
I. Increasing research-development-innovation capacity and adapting technology transfer services to market needs.	*1.1 Development of the regional research infrastructure and human resources involved in research activity* – investments in public and private research institutes / centers / laboratories to carry out research, development and testing activities, purchase of new equipment and tools, in order to bring research results to a higher TRL level; – promoting cooperation between research-development-innovation entities for the purpose of sharing research infrastructures; – ensuring researchers' access to the latest information regarding technological developments; – orientation towards new research fields, especially towards Key Enabling Technologies as well as the accreditation of KETs laboratories; – development of human resources involved in RDI, promoting multi-disciplinary research and researcher mobility; *1.2 Development of innovation infrastructures and offered services* – development of science and technology parks, technology- and competence centers - through construction, modernization, extension and endowment with necessary equipment and software, facilitating the creation of links between businesses and academia; – developing of a range of services combining the offer of research infrastructure (space, equipment) with business support services in order to facilitate innovation (intellectual	1. Operation A within Investment priority 1.1, Axis 1 of ROP 2014-2020; Through this call for proposals, the aim was to support innovation and technology transfer entities and competence centres through investments: a) creation and development of innovation and technology transfer infrastructures (, construction, extension and endowment with necessary equipment and software); b) the purchase of specific technology transfer services (other than those already offered or to be provided by the employees of the innovation and technology transfer centres); 2. Operation B within Investment priority 1.1, Axis 1 of ROP 2014-2020; Through this call for proposals, operation B, investments were supported for the creation and development of science and technology parks: a) the creation and development of science and technology parks, respectively, the construction, extension and / or endowment with necessary equipment and software; b) the purchase of specific technology transfer services (other than those offered by the employees of the science and technology parks);

	property management, financial services, marketing, etc.); – increasing the capacity of human resources to provide specific services for research and innovation; – procurement of specific services, including business consulting; *1.3 Development of technology transfer infrastructures and diversification of transfer services* – investments in existing innovation and technology transfer entities and the creation and accreditation of new entities in order to commercialize the results of research and development (tests, prototyping, etc.) through construction, modernization, expansion and endowment with necessary equipment and software; – development of new types of infrastructures that facilitate technology transfer (eg. demo-lab, living lab, fab lab, makers-space, etc.); – development of infrastructures (physical and digital) that facilitate the interaction between RDI and the business environment regarding technology transfer; – development of new types of technology transfer services closely correlated with the needs of the business environment; – development of human resources involved in providing technology transfer services – procurement of specific services, including business consulting;	3. Operation C within Investment priority 1.1, Axis 1 of ROP 2014-2020; Through this call for proposals, operation C, investments were supported for the acquisition of technology transfer results, under a "de minimis" scheme. a) the financing had been based on a partnership agreement between an SME and an EITT to validate that the technology transfer was carried out through the investment. 4. Actions within Investment Priority 1.1, Axis 1. „Research, development and innovation supporting economic competitiveness and the development of businesses" of COP (Competitiveness Operational Programme): • Action 1.1.1: Investments for Large R&D infrastructures • Action 1.1.4: Attraction of staff with advanced skills from abroad to strengthen R&D capacity
II. Increase the number of innovative enterprises, by the alignment with Industry 4.0	*2.1 Supporting innovation within companies in the fields of smart specialization* – support services for the business environment: supporting internationalization,	1. Operation for specific objective 1.2. within Investment priority 1.1, Axis 1 of ROP 2014-2020; Through this call for proposals, it has been intended to support specific innovative activities

standards and by private investments in RDI.	B2B events, matchmaking, innovation audits, etc.; – support for the procurement of technology transfer services specific to companies' needs; – encouraging RDI activities within companies, investments in private RDI; – promoting the acquisition of new technologies, including investments in energy efficiency, sustainable use of resources, eco-innovation measures; – increasing cooperation between companies from different sectors; – increase the absorption capacity of available public funds, especially Horizon 2020 - SME Instrument; – internship programs in innovative companies; *2.2 Mobilization of private capital to support RDI* – establishing venture capital funds and business angel networks; – more efficient use of financial instruments available at national and European level by the business environment; – boosting domestic private investments in start-ups and spin-offs; – attracting foreign direct investments in areas of smart specialization; – promoting public-private partnerships in the fields of smart specialization; – creating platforms to promote innovative ideas and regional assets dedicated to potential foreign investors; *2.3 Digitization of the business environment in areas of smart specialization* – promoting the use of digital technologies in companies in order to increase visibility (web pages, online marketing);	carried out by SMEs, with the main purpose of demonstrating the market viability and the proof of concept for products, services or processes and facilitate the introduction to the market. 2. Actions within Investment Priority 1.1, Axis 1. „Research, development and innovation supporting economic competitiveness and the development of businesses" of COP (Competitiveness Operational Programme): • Action 1.2.1: increasing the demand for innovation through R&D projects carried out by enterprises individually or in partnership with R&D institutes and universities, with an emphasis of process and product innovation in sectors with a high growth potential. • Action 1.2.2: Lending instruments and risk capital measures for innovative SMEs and research organizations responding to market demands.

	– facilitating the use of digital technologies for increasing productivity (production lines, automation, robotics, digital technologies in management, organization of activities, etc.); *2.4 Human resources development in areas of smart specialization* – correlating the educational offer with the market demand in the fields of smart specialization; – increasing the number of employees in the fields related to STEM or HRST; – development of schemes for placing researchers in enterprises; – increasing the level of digital literacy of employees and providing specialized support services in smart specialization sectors (accounting, legal aid, etc.); *2.5 Creation of new, innovative enterprises* – supporting the creation of innovative start-ups and spin-offs; – developing the entrepreneurial spirit and skills in young people; – development of business support infrastructures (business incubators, accelerators, hubs, etc.);	
III. Streamlining regional, national and international cooperation between different actors in the innovation ecosystem.	*3.1 Facilitating the integration of relevant local actors into cooperation networks related to research, development, innovation and technology transfer* – setting up cooperation networks between R&D entities, innovation and technology transfer entities at regional level; – supporting the cooperation between regional R&D institutions with similar entities at national and international level, especially the integration into European networks;	1. Priority Axis 1. of the Interreg Europe 2014-2020 Programme: „Research, technological development and innovation”. 2. Horizon 2020 Research and Innovation Programme. 3. Priority Axis 1: „Innovation and social responsibility in the Danube Region” of the Danube Transnational Program 2014-2020.

	3.2 Streamlining cooperation between RDI and technology transfer organizations, respectively the business environment – mechanisms and tools to facilitate interactions between the relevant entities; – initiatives, actions and activities for facilitating the cooperation between the relevant actors; – identifying key actors that can be involved in cooperation initiatives; – publishing the offers for technology transfer services; *3.3 Facilitating the cooperation within the quadruple helix model* – supporting the development of existing clusters, in order to streamline and develop activities, but also to involve new members, especially from the business environment; – creation of new clusters in areas of smart specialization; – supporting the interaction and cooperation between the public administration, the business environment, the research and development sphere and the civil society in order to generate projects and policies aimed at supporting the business environment; – facilitating the interaction between the local / regional level and the central administration in order to correlate policies, strategies, public policy measures; – creating mechanisms and tools to facilitate interaction between the relevant actors;	4. Establishing of clusters in the fields of ICT, furniture and renewable energies facilitated by the North-West RDA. 5. Actions within Investment Priority 1.1, Axis 1. „Research, development and innovation supporting economic competitiveness and the development of businesses" of COP (Competitiveness Operational Programme): • Action 1.1.3: Create synergies with the RDI actions of the European Union's HORIZON 2020 framework program and other international RDI programs. • Action 1.1.2: Development of networks of R&D centres, coordinated at national level and connected to European and international networks and ensuring researchers' access to European and international scientific publications and databases. • Action 1.2.3: Knowledge Transfer Partnerships.

3.5. Implementation methods

The implementation processes

Implementation process for the 2014-2020 Regional Operational Programme at regional level meant preparing and informing potential beneficiaries, and then emphasizing on the activities of evaluation, contracting and implementation of projects in order to achieve indicators set in the Programme for the development of the North-West Region. The Priority Axis one finances the following actions:

- Creation and development of Innovation and Technology Transfer Infrastructure (ITT), including Science and Technology Parks, construction, modernization, extension and purchase of necessary equipment and software,
- Procurement of specific technology services, including consultancy
- Investments for SMEs for implementing the results of research and innovation, in partnership with an ITT entity

The eligible beneficiaries for this priority axis are:
· accredited technology transfer and innovation infrastructures
· Science and technology parks,
· SMEs in partnership with ITT entities

Implementation mechanisms

Given that Priority Axis 1 within the ROP has three separate priorities, each one of them has a separate implementation mechanism, as follows. These implementation mechanisms have been amended with the specific issues related to priority 1.2. for projects financed as a result of participating in the Lagging Regions project of DG Regio.

Operation 1.1.a) Innovation and technology transfer infrastructures

Step 1. - Elaboration of the Regional Concept Note (RCN)

The RCN has been elaborate at the level of each of the seven development regions eligible for funding from Priority Axis 1 of the ROP 2014-2020, based on a common methodology provided by the ROP MA

• For regions that have already had an approved RIS3, the CNR had to reflect, in summary, the provisions of RIS3, respectively o more detailed justification for the conclusions on the location, economic sectors and types of services for which funding could be obtained by EITT and by SMEs that can implement the results of the technology transfer process.

• For regions which did not have an approved S3, the RCN had to represent an independent document identifying regional areas of smart specialization. Until the identification of areas of smart specialization

at regional level through RIS3, the national areas of smart specialization would be applicable for the project calls.

The elaboration of the RCN in the North-West Region has been carried out in a broad partnership with all relevant actors like academia, research institutes, EITT as well as the business environment. The partnership process had a bottom-up approach in order to identify and analyse the needs of the business environment in terms of technology transfer, as part of the EDP process.

Step 2. - Call for expressions of interest from EITT

The call for Letters of intent from the EITT was based on a standard methodology, the received documents having to include information, like the presentation of the applicant, past experience, vision, analysis of needs, already existing mechanisms for the facilitation of technology transfer, new mechanisms needing to be implemented, etc.

Step 3. - Prioritization of projects according to the information in the expressions of interest

The expressions of interest were analysed and prioritized by the partnership structure in charge of elaborating the RCN.

Step 4. - Submission of applications by EITT

Submission occurred through the standard procedure for submitting projects under the ROP 2014-2020, at regional level. The allocation of funds for financing EITTs was due to be implemented in stages, depending on the intermediate milestones set within the framework of the projects. According to the call, the activities which could be undertaken by an EITT in areas of Smart Specialization could be of 2 types:

- Basic technology transfer activities
- Technology transfer services with a high added value

One of the criteria demanded from these entities was to be or to become members in national or international innovation and technology transfer networks.

Operation 1.1.b) Science and technology parks

The respective priority would finance Science and Technology Parks in their entirety, with activities like construction, modernization, extension, purchase of equipment, etc., given the fact that Romania is lagging behind when it comes to the STP infrastructure necessary for holding up in an international economic competition.

Operation 1.1.c) SMEs in partnership with EITTs

This priority aims to finance SMEs under a de minimis scheme in order to acquire technology transfer results and implement them within their own economic activities. Funding has been conditioned by a

written agreement/partnership with a technology transfer entity in order to ensure that the technology transfer would in fact be implemented through the respective investment, thus, at the same time, contributing to the sustainability of the technology transfer entity.

Operation 1.2. Increasing innovation in companies by supporting a multi-sector approach as a result of implementing the Lagging Regions Initiative in Romania. The implementation mechanism of Operation 1.2. within Priority Axis 1 - Promotion of technology transfer has been elaborated in accordance with the provisions of the Regional Operational Program. This operation is the result of implementing the "Support for smart specialization of less developed regions" project at the level of the two regions selected as a pilot (North-East and North-West Development Regions).

The purpose of this specific operation is to support the implementation of smart specialization projects which contribute to the regional smart specialization objectives. The projects have been developed based on an Entrepreneurial Discovery Process (EDP), accompanied by other specific consultation activities, in order to generate project ideas that can contribute to achieving strategic objectives and indicators. Consequently, a portfolio of strategic projects has been developed and proposed for financing through Priority Axis 1. Operation 1.2.

The mechanism for building the portfolio of strategic projects involved the following steps:

1. Identification and validation of regional smart specialization approaches related to RIS3 priority areas through EDP workshops organized in the 2016-2017 period;

2. Organization of regional calls(s) for collecting project proposals for the RIS3 portfolio, corresponding to the solutions identified in Stage 1;

3. Structuring the portfolio of received project proposals, by RIS3 priority areas and funding sources to identify integrated projects which could not be financed from one single funding source;

4. Elaboration of extended project fiches and supporting the promoters of integrated projects for concept maturation and definition of the list of integrated strategic projects;

5. Approval of the list of integrated strategic projects recommended for ROP funding by the Steering Committee for the elaboration of the Smart Specialization Strategy as well as the Regional Development Council;

6. Submission of funding applications by project promoters through the standard ROP 2014-2020 submission procedure at regional level.

During the implementation of the ROP, the list of strategic projects recommended for financing did not change.

3.6. Budget

Total budget for the selected Policy instrument - priority Axis 1. “Promoting technology transfer” of 2014-2020 Regional Operational Programme for all seven eligible regions of Romania is 206,51 mil euro, with the North-West Region having a total allocation of approximately 44.41 mil euro, respectively:

- For the 3 operations under Priority 1.1. – approximately 15.00 mil euro (12.5 mil euro – ERDF, 2.5 mil euro – State Budget).;

Type of beneficiary	Call for proposal		
	1.1.A - entities of innovation and technological transfer	1.1.B - Science and technology parks	1.1.C - SMEs research-innovation
Large enterprise[2]	50%	50%	-
Medium enterprise	60%	-	-
Small enterprise	70%	-	-
Partnership between SME and technology transfer entity	-	-	90%
Min-Max project financing per call	75.000 – 3 mil (euro)	Minimum 75.000 euro	Minimum 25.000 euro

Table 4. Maximum public co-financing rates projects financed under Specific Objective 1.1.

Source: 2014-2020 Regional Operational Programme

- For Operation 1.2: Increasing innovation in companies by supporting multisector approaches resulting from the implementation of the "Less Developed Regions Initiative” – approximately 29.41 mil euro (25 mil euro – ERDF, 4.41 mil euro – State Budget).

Within Operation 1.2., the co-financing rates for enterprises are calculated as a percentage of the eligible costs for the respective activities, by types of expenditure and according to the type of enterprise (large, medium, small, micro-enterprises), as well as the criteria for effective collaboration or dissemination of results.

[2] Beneficiaries under public law are considered large enterprises, under certain conditions

Activities	Enterprises		
	Large	Medium	Small
Industrial research	50%	60%	70%
Industrial research in effective collaboration or with the dissemination of results	65%	75%	80%
Experimental development	25%	35%	45%
Experimental development in effective collaboration or with the dissemination of results	40%	50%	60%
Carrying out feasibility studies prior to research and development activities	50%	60%	70%

Table 5. Maximum public co-financing rate for projects financed under Operation 1.2.

Source: ROP 2014-2020

Investment priority	Call end date	SUBMITTED PROJECTS				PROJECTS REJECTED / WITHDRAWN				Projects in selection/contracted	Call / region allocation (ERDF + NB)	% call / region allocation coverage
		Nr. submitted projects	total value	eligible value	non-refundable value	Nr. projects rejected / withdrawn	total value	eligible value	non-refundable value			
1.1.A - entities of innovation and technological transfer	20.02.2019	8	27,2	26,1	13,4	5	10,57	10,40	5,49	3	5,06	157,05%
1.1.B - Science and technology parks	13.04.2019	2	7,1	6,9	3,6	1	0,09	0,08	0,07	1	5,00	69,90%
1.1.C SMEs research-innovation	25.08.2018	18	4,4	3,5	3,2	18	4,43	3,55	3,18	0	4,93	0,00%
1.2. - Smart specialization in less developed regions	31.03.2020	2	8,6	7,6	6,4	1	3,49	2,93	2,93	1	29,41	11,82%

Table 6. The situation of the projects submitted within the Axis 1 of the ROP 2014-2020 in light of the available financial allocation, (30.04.2020 - mil euro)

The entire budget of Axis 1 within the ROP 2014-2020 was allocated under the intervention field „062. Technology transfer and cooperation between universities and enterprises, mainly for the benefit of SMEs".

3.7. Governance

The 2014-2020 Regional Operational Programme is managed at national level by the Ministry of Public Works, Development and Administration, regional development agencies at regional level acting as Intermediate Bodies, carrying out the specific activities that were delegated through the Framework Agreement for delegating the attributions regarding the implementation of the ROP. This agreement was concluded for the entire implementation period of the 2014-2020 ROP, as well as for a period of 5 years

from the date of official closure. The tasks thus delegated to the Intermediate Bodies concern the following aspects:

- Programming
- Evaluation, selection and contracting of operations / projects
- Verification of purchases and requests for reimbursement and payment
- Project monitoring
- Information and communication
- Support for potential beneficiaries / beneficiaries

The Ministry of Public Works, Development and Regional Development and Public Administration has been appointed to fulfil the specific task of Managing Authority of the 2014-2020 ROP, the specific MA tasks being carried out within the General Directorate of the Regional Operational Programme, with the support and in collaboration with other support structures within the Ministry.

The responsibility of monitoring has been assigned to the Monitoring Committee of the ROP, representing a national structure without legal personality, with a strategic decision-making role in the ROP implementation process, established in accordance with the provisions of Regulations (EC) No. 1303/2013, 1234/2007 and 1083/2006 of the European Parliament and of the European Council, ,laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Fisheries and Maritime Fund The ROP of the Monitoring Committee is made up of:

- 1/3 of the members are representatives of the MA;
- 1/3 of the members are representatives from regional and local level
- 1/3 of the members are regional representatives from business, academia, trade unions, and civil society.

Other bodies relevant for the implementation system of Priority Axis 1 of the ROP are:

- Certifying and Payment Authority (CPA): Ministry of Public Finance (MFP)
- Audit Authority: Court of Auditors

Another key player in the system are the beneficiaries of projects financed under Axis 1 of the ROP, representing the following types of actors: accredited innovation and technology transfer infrastructures, accredited science and technology parks, SMEs in partnership with EITT.

3.8. Monitoring, assessment, evaluation

The monitoring activities aim to analyse the effects of the actions that were applied, considering the analysis of output and result indicators. For the policy instrument - priority Axis 1. “Promoting technology transfer” of the Regional Operational Program 2014-2020, analysed indicators are:

Indicator code	Indicator name and unit of measurement
1S1	% Innovative SMEs collaborating with others
1S2	Supported EITT
CO01	Productive investment: Number of companies receiving support
CO02	Productive investment: Number of companies receiving grants
CO04	Productive investment: Number of companies receiving nonfinancial support
1S70	Cooperation implemented as a result of the "Less Developed Regions Initiative"

Table 7. Indicators for Axis 1. ROP 2014-2020

6. SWOT analysis of the policy mix

Strengths	Weaknesses
• The institutional structures developed under ROP to support smart specialization process at regional level are functional; • The support and guidance received from the RDA and the JRC for the preparation of the projects had an added value for the beneficiaries; • RDA activities for improving the stakeholders’ degree of involvement and for creating a participatory process has been evaluated positively by both research organizations and companies; • The systematic process of consultation between the business sector and the research sector is perceived as functional by enterprises; • The elaboration of RIS3 and of the Regional Framework Document (RFD) by the	• Weak conceptual framework, deficiencies of conceptual understanding on the side of the target group, as well as frequent changes brought to the Applicant's Guides of the financing instruments, leaving room for misunderstandings and misinterpretations; • Project fiches were identified and prepared in a non-productive way, because of the absence of an Applicant's Guide relating to the specific requirements of the calls within Axis 1 of the 2014-2020 ROP; • The launch of the final Applicant’s Guide for calls under Priority Axis 1 has been launched more than one year after the submission of the letters of intent and project fiches, with some additional conditions and requirements;

partnership structures created at regional level under the coordination of the RDA have brought together universities and representatives of the business environment for the first time, facilitating thus the collaboration between creators and end users of innovation.	• Applicant's Guide was drafted with very little consultations with the RDAs and the potential beneficiaries; • The minimum 50% co-financing rate according to the European state aid regulations has proven to be excessive and has made it very difficult to find eligible applicants both in the research area (EITT, PST) and among SMEs interested in partnering with EITT;
Opportunities • Increased concern of the RDA for the strategic planning and the adoption of public policy documents in the R&I field; • Ensuring the protection of intellectual property is a common activity and concern in the case of most research organizations;	**Threats** • The high cost of technology transfer is a barrier; • Ensuring intellectual property is a barrier for research organizations; • The low interest of TT/research entities to adapt to market needs, which can be a barrier in the creation of partnerships for the economic valorisation of the results of the applied research; • Research results from the universities are (in the form of publications, products, technologies, methods, services) are mainly used to advance the professional career of the teaching staff or to gain public recognition and prestige and, less, for economic valorisation of the results; • The registration of applied research results with OSIM (patents) is a very bureaucratic, lengthy and a relatively costly process;

7. Main conclusions and areas for improvement

For the elaboration of the main conclusions and areas for improvement we have taken as a starting point the Evaluation Report for Priority Axis 1. „Promotion of technology transfer" of ROP 2014-2020, which was developed at the national level by Lattanzio Advisory under a contract with the Ministry of Public Works, Development and Administration, as Management Authority for the 2014-2020 Regional Operational Programme.

One of the main findings is related to the need for having an approach over a multiple programming cycles, in order to ensure the continuity of the specific Axis of the ROP, so that there would be a durability of the specific investment priorities under the 2021-2027 programming cycle as well. The time remaining under the current programming period could be used to improve the strategic approach, to develop a project portfolio at regional level and to experiment with different types of calls, for example closed call on the list of pre-identified eligible projects. Another preliminary conclusion is that experimenting is a sine qua non condition for the demonstrative effects which both the applicative research sector and TT entities, and the economic, business sector need in the learning process as regards the promotion of innovation through the technology transfer. One conclusion reached so far is that stakeholders at regional and national level have not really shared experience, both at decisional as well as at operational level. Thus, it remains to be seen to what extent the future National Strategy for Smart Specialisation 2021-2027 will capitalise on the regional decisions already made regarding the areas of smart specialisation established at regional level and how the coherence and congruence/alignment will be ensured between the two levels of strategic planning in line with the Strategic Planning Manual and the Governmental Memorandum whereby the actors, the responsibilities and the deadlines are set out.

Coagulation of the entire budget from one priority axis into a single intervention field may lead to a number of shortcomings that can hinder the absorption process of the European funds. Under Axis 1 of the ROP 2014-2020 all funds were allocated under a single intervention field: "062. Technology transfer and cooperation between universities and enterprises, mainly for the benefit of SMEs", although for example, investments in the development of science parks have also been foreseen as actions to be supported. However, STPs should have benefitted from funding allocated under another specific field of intervention dedicated to science and technology parks: code 059. As a result, when launching the specific call targeting STPs, in order to be able to finance the foreseen actions under the selected intervention field, the MA has adopted an intermediate solution by introducing several constraints, limiting the actions to be financed to cooperation and technology transfer. This in turn has led to serious difficulties when drafting the project proposals by the beneficiaries. As a conclusion, in order to facilitate the accession of the EU funds through the Regional Operational Programmes it is recommended that the MA break up the financial allocation and allocate it under several fields of intervention in accordance with the draft project portfolio and the operations proposed to be financed, so as not to create additional unnecessary obstacles for the beneficiaries.

Boosting the increased participation of professional associations in the quadruple helix structure as a vehicle for further dissemination and strengthening of partnerships to promote research results would provide a protective net and would favour the wider dissemination of the information and the knowledge gained. Thus, it could contribute under an associative coordination to attracting stakeholders from the business sector into the consortia for the promotion and the internalisation of innovation in a collaborative way, which would be likely to encourage the members in assuming the risks inherent to approach some territories and new exploratory technologies, as well as to the sharing of imminent risks.

Strengthening institutional memory and the sustainability of Regional Innovation Consortia/Steering Committees (in charge with the elaboration and implementation of Regional Smart Specialization Strategies) would be another key issue, emphasizing the importance of taking adequate measures to manage the risk factors and transfer the pool of knowledge acquired by the people co-opted in these structures. The transfer and dissemination of the pool of knowledge should be the subject of future technical assistance projects.

Additional aspects that should be considered: the simplifying the administrative and eligibility conditions - which proved to be significant barriers for both TT entities and EITT partnerships with SMEs - extending the eligibility of projects and expenses to all stages of technology transfer: services, equipment under-used by centres, etc., even extending the eligibility criteria for applicants to regional innovation hub projects.

A minimum 50% co-financing value for innovation projects according to European state aid regulations has been found to be excessive, making it difficult to set up eligible partnerships both in the research area (EITT, PST) and for SMEs interested in partnering with EITT. Moreover, the conditionality that this own contribution derives from a source other than the state budget represents an obstacle impossible to surmount by the TT entities from universities. The majority of universities active in the field of applied research which are involved in the transfer of research results to the market are public institutions funded from the state budget. Own revenues account for a small percentage of the university's revenues and derive from the tuition fees paid by students. The ability of each university to generate extra- budgetary revenues is very different from one university to another, as it relates to the profile of the respective higher education institution, its reputation and location within the major university centres.

It has been found that there is a strong need to stimulate and identify alternative funding sources for projects that propose innovative solutions through economic valorisation of the research results – like venture capital, business angels, participatory interest in the capital of investment funds, issuance of shares and bonds (public loan from consumers, suppliers, etc.) in order to go beyond the stage of S3 innovation achieved from subsidies / grants / state aid. The proposed solutions would be to elaborate programs that bring venture capital to Romania, teach potential beneficiaries on how to cooperate with these institutions - different points of view - banks, ministers, etc., transfer best practices from different

countries of the world. Stimulating the identification of alternative funding sources can be supported by, for example:

- Developing RDA's administrative and institutional capacity to identify and attract innovative financial instruments for 'the financial engineering of high-value and high-risk integrated projects'
- Providing financial support to organise annual innovation fairs with an international participation.

To be able to valorise results and experience at regional level, it is necessary to establish a constant and systematic dialogue in order to achieve a common understanding of the aspects linked to innovation and smart specialisation, an in depth common knowledge of the different EU regulations on this matter, as well as co-opting the main links from the regional institutional system of innovation (Regional Innovation Consortia/Steering Committees of Regional S3s and RDAs) in the new Administrative Capacity Operational Programme funded projects (SIPOCA).

The main dissatisfaction among the stakeholders at regional level was that the development of Applicant's Guidelines for the calls took a very long time. For instance, as regards the guidelines for the call under Priority 1.1.C - the first call launched in chronological order - its preparation lasted more than 9 months and, taking into account the period during which the call remained open, it goes up to almost one year - a period during which the organisational conditions have changed dramatically. As a result, the project portfolio identified in 2017 could not meet the requirements imposed in the Applicant's Guideline; thus, many of those who expressed interest under calls 1.1.B and 1.1.A withdrew their intention.