RIS 3
Sud-Est

The Regional Smart Specialization Strategy (RIS3) for the South-East Region 2021-2027

SUMMARY

ADR

Agenţia pentru Dezvoltare Regională Sud-Est

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Acronyms

CAI	Comparative Advantage Index
CANE	Classification of Activities in the National Economy
CIF	Cost, Insurance, Freight / Cost, Asigurare, Navlu
CN	Combined Nomenclature
CPI	Competitive Potential Index
EEOP	Education and Employment Operational Program
ERDF	European Regional Development Fund
EU	European Union
FDI	Foreign Direct Investment
FOB	Free on Board / Liber la bord
GAV	Gross Added Value
GDP	The Gross Domestic Product
ICT	Information and Communication Technology
IGDFIOP	Intelligent Growth, Digitization and Financial Instruments Operational Program
JTOP	Just Transition Operational Program
NABS	Nomenclature for the analysis and comparison of budgets and scientific programs
NASRI	National Authority for Scientific Research and Innovation
NBR	The National Bank of Romania
NIS	National Institute of Statistics
NP	National Program
NPRTDI	National Plan for Research, Technological Development and Innovation
OECD	Organization for Economic Cooperation and Development
PPCP	Purchasing Power Parity
PPS	Purchasing Power Standard

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RDA	Regional Development Agency
RDI	Research Development Innovation
RIC	Regional Innovation Consortium
RIS3	Regional Innovation Strategy
ROP	Regional Operational Program
SEO	Social Economy Organizations
SMEs	Small and Medium Enterprises
SOIT	State Office for Inventions and Trademarks
SRSI SE	Regional Strategy for Smart Specialization of the South-East Region
TAOP	Technical Assistance Operational Program

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Introduction
The purpose of the strategy

According to the RIS3 guideline published by the European Commission, the regional research and innovation strategies for smart specialization (RIS3 strategies) are integrated agendas based on an "on-the-field" analysis of a region's economic transformation, typically characterized by five main criteria[1]:

- Focuses policy support and investment on key national/regional priorities, challenges and needs and is aimed at knowledge-based development.
- It is based on the individual strengths, competitive advantages and the potential of excellence of each country/region.
- Supports technological innovation as well as innovation on a practical basis and aims to stimulate private sector investments.
- Supports the full involvement of stakeholders and encourages innovation and experimentation.
- Are evidence-based and include robust monitoring and evaluation systems.

Increased investment in research, innovation and the development of entrepreneurship is one of the milestones set in the Europe 2020 Strategy, which pursues a strategic and integrated approach to innovation in order to maximize the potential for research and development at territorial level. At the same time, at the level of the new Cohesion Policy, smart specialization is an ex-ante conditionality, accessing European financial support being contingent on assuming a coherent public policy in the field of smart specialization.

Within this context, the South-East Regional Development Agency, as a non-governmental body of public utility that activates in the field of regional development, proposed to update the Region's Smart Specialization Strategy for the 2021-2027 programming period. The main objective of this strategy is to substantiate the strategic planning process regarding the development of the South-East Region for the 2021-2027 programming period, by updating and reviewing the statistical information included in the socio-economic analysis of the region in the last 6 years, with focus on the best performing economic sectors at regional level, by mapping the relevant regional actors in research and innovation, continuing the process of entrepreneurial discovery (EDP) and identifying those areas that have competitive advantages and the potential for knowledge-based transformation. The results of the present study will substantiate the elaboration of the public policy directions related to the 2021-2027 programming period and will

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[1] https://ec.europa.eu/regional_policy/sources/docgener/informat/2014/smart_specialisation_ro.pdf

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be correlated with the results of other strategic planning processes that are carried out in parallel at European, national and regional level.

The process of elaborating the Strategy

The Regional Smart Specialization Strategy of the South-East Region 2021-2027 was implemented through a partnership process, which aimed to involve sectors with a strong innovative character (enterprises, young entrepreneurs, clusters, business organizations/ chambers of commerce, universities, public and private research institutions/bodies, science and technology parks, technology transfer entities, local public authorities, incubators, county school inspectorates, NGOs, social organizations and other relevant institutions).

The elaboration of the Strategy focused on a limited number of competitive areas, identified following the process of socio-economic analysis carried out at regional level, as well as following a survey applied among the representatives of the business environment, business support structures, universities, research institutes, research centers and technology transfer centers. The partnership process of setting innovation priorities at the regional level has ensured the assumption of responsibilities regarding the implementation of the Smart Specialization Strategy.

The Regional Smart Specialization Strategy of the South-East Region 2021-2027 included the following main directions:

- Analysis of the regional context and the innovation potential;
- Organizing a number of six Entrepreneurial Discovery Meetings (EDPs) on the areas of smart specialization identified in the region, with the representatives of the target group relevant for each field;
- Application of questionnaires among each category of representatives of the target group;
- Elaboration of a global vision for the future of the region;
- Defining the mix of coherent policies, measures and lines of action;
- Integration of the monitoring and evaluation mechanisms of the Regional Strategy of Smart Specialization of the South-East Region.

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Chapter I. The analysis of the regional context and of the innovation potential of the South-East region
Regional assets – technological infrastructures

In order to have an overview of the economic context that characterizes the South-East Region, in the section related to regional assets, the relevant macro and micro-economic indicators were analyzed to reflect the regional economic context, to identify sectors of economic activity with significant contribution to regional GDP and to differentiate the areas with the most significant potential for smart specialization.

Thus, at macroeconomic level, in the reference period considered (2014-2017) the Gross Domestic Product related to the South-East Region registered a sustained growth trend, representing in 2017 10.26% of the national GDP (ranking the region on the 6th position) and 0.12% of the European Union's GDP (EU28). A similar evolution was observed in terms of the degree of competitiveness of the Region's economy, the Gross Value Added for the analysed period reflecting a similar growth rate. However, a comparative analysis of these indicators revealed that the South-East Region was, over the time, outperformed by the North-East, North-West and Central Regions. The sectors with the highest contribution to regional GVA in the case of the South-East Region are agriculture, forestry and fishing (6,701.3 million lei GVA - placing the region on the 2nd place at national level) and construction (with 5,229.8 million lei GVA).

At the level of 2019, the labor resources at national level amounted to 12.1 million people, of which 1.4 million people in the South-East Region (representing 12% of the national value). Most of the labor resources from the South-East Region, respectively 431 thousand people, were concentrated in Constanța County, and the smallest part in Tulcea County, respectively 118 thousand people.

At regional level, the active population (employed population and registered unemployed persons) reached the value of 956 thousand people, resulting in an activity rate of 67.7%, which ranks the South-East Region on the 5th place, after the South-West Oltenia Region (69.2%). The agricultural sector has the highest share of the employed population in the region (25% in 2019), followed by the manufacturing industry (17%) and the wholesale and retail sector (15%). The Information and Communication sector accounts for 9.8% of the employed population in the region, registering a decreasing trend in the period 2015 - 2017. At the level of 2019, the South-East Region ranked on the 6th position in terms of the human resources employment rate (64%), registering higher values only compared to the Central Region (63.9%).

Regarding the educational offer at the level of the South-East Region, in the 2014 - 2019 period, the number of active school units decreased for all categories of education.

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At the same time, higher education institutions attracted 2,000 more students between 2014 and 2019. These university centers offer courses configured according to the regional particularities. Regarding technical and vocational education, at the level of the analyzed interval there was a sustained trend of increasing the number of graduates of the vocational high school cycle, in the case of all counties there were increases of over 100% in 2018 compared to 2014.

Entrepreneurship in the South-East Region - The situation of enterprises in the period 2014-2020

At the level of the South-East Region, in the 2014-2018 period, the actual number of active local units increased by no less than 8.4%. The industry of professional, scientific and technical activities experienced a significant increase in the number of active local units, from 4,473 units in 2014, to 5,407 active units in 2018, representing an increase of 17.28%. The ICT sector also increased by 21.15% in the same period.

In what concerns the density of active local units, it is observed that the most developed counties are Constanța and Galați. The dynamics of SMEs reveal an upward trend both at regional and national level.

The number of employees in the region places the South-East region on the fifth place at national level, with an average number of 554,174 employees. With the exception of Brăila County, all other counties have seen an increase in the number of employees. The analysis of the economic sectors reveals that the highest average number of employees is found in the sector of water distribution, sanitation, waste management and decontamination activities, with a total number of 15,443 people. In 2019, the field of agriculture, forestry and fishing registered 19,138 employees, and the branch of HORECA services was also an important one for the region. Regarding the gender of employees, it is noted that the only county in which there are more women than men employed is Vrancea. The average salary in the South-East Region is increasing, but below the values of the leading regions (Bucharest-Ilfov Region, with 3,947 lei, West Region, with 2,879 lei, North-East Region, with 2,781 lei, South-East Region, with 2,551 lei). Analyzing the evolution over time of the labor productivity in each economic activity, it is observed that, at the level of the South-East Region, between 2013 and 2017, this indicator was on a positive trend for all economic activities, except construction, where the productivity between 2013 and 2017 decreased with 15%.

The investments in the South-East Region are among the lowest compared to other development regions, totaling 4.2% in 2018 (compared to Bucharest-Ilfov - 60.7%, Center Region - 9%, etc.).

The comparative advantages of the South - East Region present Constanța as the county with the highest value of exports, and Tulcea with the lowest value; the same situation is also valid for the

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imports. At the regional level, the groups of base metals products, mineral products, vegetables, textiles and food have the highest value of exports.

The industrial activity is concentrated in all the counties in the region, with Constanța on the first place and Tulcea on the last position. Vrancea has an increased activity in the manufacture of clothing and in wood processing. Tulcea has the most developed food industry, followed by the shipbuilding and repair industry. In Galati county, the mechanical sector is the most developed, and in Constanța the industrial activities are oriented towards the mechanical and chemical sector, having as peak sector the production of ships and aquatic means of transport. Also, in Constanța there is the metal industry, rubber and plastics processing and activities in the production of machines and equipment. In Buzău County, traditional industrial activities (food industry and furniture production) include a large number of companies. The food field, the clothing production, the metal construction industry are the most developed branches in Brăila county.

The analysis of the comparative advantage index reveals that the South-East Region registers comparative advantages with RCA> 1 for the sections: live animals and animal products, animal or vegetable fats and oils, mineral products, base metals and correspondent articles (for the 2017 - 2019 period) .

Regional analysis in the field of Research, Development, Technology Transfer and Digitization

The regional disparities in terms of research and development expenditures are very large, with the South-East Region registering the lowest expenditures. The trend is slightly upward, but this very low growth rate deepens the inequalities already created compared to the rest of the regions. At regional level, the number of employees in research and development has increased in recent years, the highest value of this increase being recorded in 2017 and 2018.

The number of patent applications places Buzău on the first place at regional level and Tulcea on the last place. At the same time, the number of applications for registration of designs/models is the highest in Galați and the smallest in Vrancea. The number of trademark applications places Constanța on the first place, with a number almost double than the one of Galați, the county occupying the second place. Tulcea is the county with the fewest requests of this kind.

The research-development institutes at the level of the South-East Region are: "Danube Delta" National Research-Development Institute - INCDDD Tulcea, "Grigore Antipa" National Research-Development Institute for Marine Research - INCDM Constanța, National Research Institute - Development for Marine Geology and Geoecology - GeoEcoMar, Research-Development Institute for Aquatic Ecology, Fisheries and Aquaculture Galati - ICDEAPA, Palas Research-Development Institute for Sheep and Goat Breeding.

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Accredited higher education institutions or their structures	
Civil state higher education institutions:	"Ovidius" University of Constanța
	Maritime University of Constanța
	"Dunărea de Jos" University of Galați
Military higher education institutions	"Mircea cel Bătrân" Naval Academy from Constanța
Accredited private higher education institutions	"Danubius" University of Galati
	"Andrei Șaguna" University of Constanța
Private higher education institutions authorized to operate on a temporary basis	"Gaudeamus" Foundation - "Tomis" University of Constanța

There are also other entities with a role in research and development such as: Research and development station for vegetable growing Buzău, Research and development station for viticulture and vinification - Bujoru, Research and development station for viticulture and vinification Murfatlar, Research-development station for fruit growing Constanța, Eco-Museum Research Institute "Gavrilă Simion" Tulcea, CEPROHART SA, ROMANIA-EUROEST SA. etc.

In what concerns the competitive potential index, both Romania and the South-East Region register values well below the European Union average. Among the Romanian regions, South - East is placed on the penultimate position. The GDP/inhabitant indicator places Constanța County on the first place and Vrancea on the last position. Regarding the capitalization of technology in productive activity, at the level of 2017, in the South-East Region the exports of medium-low technology (58.88%) predominated, followed by the exports of low technology (37.22%). The analysis revealed that the South-East Region has a low potential for competitiveness.

In the 2014-2016 period, at the level of the South-East Region, the share of innovative enterprises was 16.9%, representing the highest level of innovation among all the development regions of Romania.

The most important clusters in the region are: Traditions Manufacture Future Association (Cluster Traditions Manufacture Future TMV South-East), Green Solutions Lower Danube Regional Cluster, BIO DANUBIUS Cluster, INOMAR Cluster, CLUSTER MEDGreen Association, Lower Danube Health Cluster, IT&C Lower Danube Cluster, Romanian River Transport, "Open Hub" Cluster, InnoSTArts Innovative Cluster (ISTA), "Lower Danube" Innovative Agroindustrial Cluster.

There are also noteworthy the industrial parks (Galati Industrial Park, Mangalia Industrial Park) and accredited innovation and technology transfer entities: Danube Delta Technology Information Center (CITDD), Technology Transfer Center - "Lower Danube" University of Galati

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(CTT-UGAL), Center for Entrepreneurship and Technology Transfer (CATT) - Ovidius University of Constanța and Galati Software Park.

In terms of digitization, mobile devices are the ones with the highest utilization rate in the South-East Region. Most often, the citizens of the Region use the internet in relation to public authorities to obtain information, and most rarely to download official forms. It is also worth noting that the South-East Region has the highest percentage of internet users who have not used any security device (TOKEN) for online services. At the level of the South-East Region, there are 3 digital innovation centers; CiTyInnoHub in Constanța, Danube DIH in Galați and Digital Innovation Hub South-East Romania. These entities support companies in digital transformation, offering testing facilities, skills, training, etc .

Connections/relations with the rest of the world and the Region's positioning in the European Union/global economy

The benchmark analyzes provide a comparative perspective, integrating both data on the region of interest and other similar regions. This gives a more complete picture of the state of play and the potential for development. A comparison group was created to assess the performance of the South-East Region, and the indicators identified as significant covered demographic data, data on education, technological distribution, as well as economic data and information on the institutional profile and specific values of a region. Regarding the regions included in the analysis, these are: Center and South-Muntenia Regions in Romania, Podlaskie and Lodzkie Regions in Poland and Yuzhen Tsentralen and Yugoiztochen Regions in Bulgaria, as well as Jadranska Hrvatska Regions in Croatia, Anatoliki Makedonia Thraki in Greece and Calabria from Italy.

A first overview of the evolution of regional competitiveness scores indicated that the South-East Region has a steady downward trend observed mainly since 2013, ranking the region on the last place in the analysis group. An almost mirrored situation was also observed in the case of the South-East and Anatoliki Makedonia Regions in the infrastructure quality ranking. The educational field is also deficient, compared to that of the analyzed regions, so that the South-East Region ranks last in terms of the quality of higher education and lifelong learning opportunities. The values of the aggregate indicators of the Regional Innovation Index (number of scientific publications, number of publications most frequently cited by the scientific community) place the South-East Region in the lower half of the ranking. In addition, the adaptability of the region to technology is low compared to the analyzed regions, the entrepreneurial environment demonstrating a low degree of sophistication, and the share of

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people trained in fields such as Science and Technology and the share of exports from high-tech manufacturing are also low.

In what concerns the economic stability, among the analyzed indicators it is noted that Romania and Greece occupy the first two positions in terms of government bond yields. Within the analysis group, however, all three regions in Romania were in the lower half of the ranking. The potential of the regional market size in relation to both GDP and population size is average at the level of the comparison group.

The dynamics of the entrepreneurial environment

In 2018, the South-East Region registered an innovation index of only 23.1, the value decreasing compared to previous years (in 2014 the innovation index was 28.8). Moreover, if in 2014 the indicator indicating the degree of collaboration between innovative SMEs (Innovative SMEs Collaborating) reached 23.2, in 2018 it had decreased to only 7.9.

Between 2014 and 2018, the number of active enterprises increased significantly in the South-East Region, from 57,888 in 2014 to 63,232 in 2018, this growth trend being registered at national level. Also, in the case of the South-East Region, a significant increase of the registration of new active enterprises could be observed, from 7,487 in 2014 to 13,062 in 2018. At the same time, the deregistration of companies from the South-East Region experienced a decrease in recent years, the highest being in 2020 when 51.25% fewer companies were deregistered compared to the situation in 2019. However, it can be observed a decrease in the number of innovative SMEs in the South-East Region by 8.73% between 2014 and 2016, while the number of innovative large enterprises (LE) decreased by 15.91% in the same period.

At national level, the South-East Region has the lowest share of newly created active enterprises that made investments in the first year of activity at national level. The number of full-time employees represents 43.6% out of the number of employees, the percentage of part-time employees decreasing dramatically from 7.8% in 2014 to 0% in 2018, the phenomenon being one that is also found at national level.

In 2018, 30% of the founders of new companies were under 30 years old, and 34% were aged between 30 and 39 years old. There was an increase in founders under the age of 30 and a decrease in those over the age of 50. Another important element is the increase in the number of women opening businesses from 43.7% in 2014 to 45.1% in 2018.

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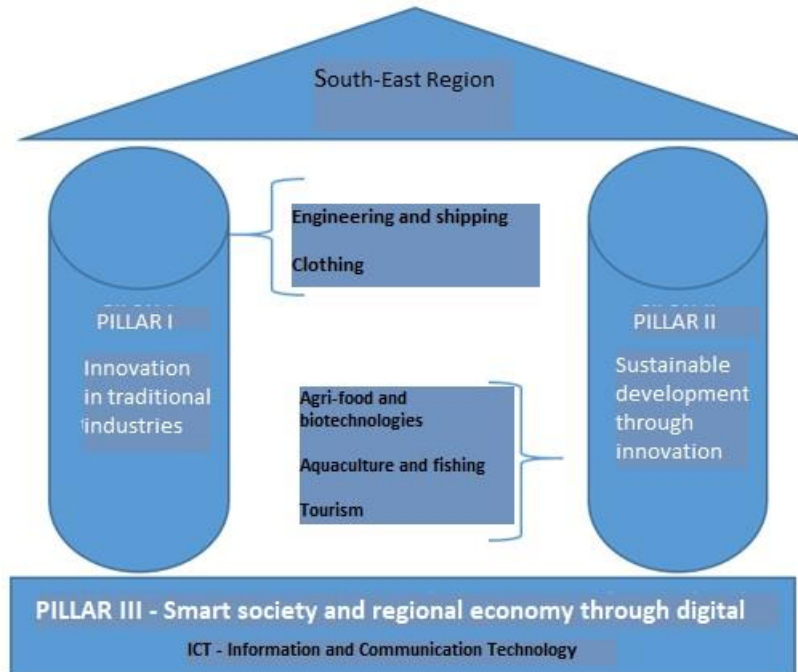
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Fields of smart specialization

In order to select the areas of smart specialization, the characteristics of the South-East Region were analyzed, from an economic, social, political, demographic and historical point of view, and a mapping of the relevant actors for development and innovation was also carried out.

The methodology for selecting the fields of smart specialization comprised four distinct stages:

a) Identification of areas with potential for smart specialization, based on quantitative and qualitative information from the analysis of the regional context and the innovation potential of the region;

b) Identification of areas with potential for smart specialization following the analysis of field research results conducted through surveys applied among regional actors relevant to smart specialization;

c) Consultation of key actors, relevant in the field of smart specialization, within the Entrepreneurial Discovery Meetings that were organized;

d) The multicriteria analysis used to describe the mentioned fields took into account 4 relevant criteria for assessing the potential of the field including: *the importance* of the field in the regional economy, *the market, the intensity of innovation* in the field, *the availability of qualified human resources* in the field.

Based on the analysis realized, 6 areas have been proposed as having the most significant potential for smart specialization in the South-East Region: (1) Engineering and shipping; (2) Clothing industry; (3) Agri-food and biotechnologies; (4) Aquaculture and fishing; (5) Tourism; (6) ICT.

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Figure no. 1 –The architecture of the fields of smart specialization for the South - East Region

Pillar I. Innovation in traditional industries

Pillar objective: Supporting the innovation in traditional industries in the region in order to increase their competitiveness at international level and to support economic development at regional level.

Priority I.1. Engineering and shipping

Importance: the counties whose geographical positioning is relevant for this field are Constanța, Galați and Tulcea, where shipyards are also present. These shipyards generally specialize in shipbuilding and repair. The ports in the region are also very important for the ease of shipping, as they are located on Pan-European Corridor VII.

Transport activities cover both public sea or river transport, passenger and freight transport, transport for personal use by legal or natural persons, and related transport activities.

Out of the 2,635 km of inland waterways available in Romania, 1,048 km are in the South-East Region, representing 40% of the total. In addition, out of the 182 km of navigable canals, 70% (128 km) are in the South-East Region.

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Market. In 2015, the first 8 shipyards of the country registered revenues of 4,405,408,750 lei. Significant increases in revenues compared to the previous year demonstrate an upward trend. In the same year, the number of patents and certificates was 33,000, and the domain brought together 21,000 navigators active in the navigation safety system, out of which 14,600 active navigators and 12,000 were auxiliary personnel.

The intensity of innovation in the field. The most important naval research and design center in Romania, ICEPRONAV S.A., is located in Galați. The innovation in the field is also supported by the Romanian Shipbuilders Association - ANCONAV and by the educational and research institutions in the field.

Availability of qualified human resources in the field. The profile universities in Galați and Constanța are the main sources of highly qualified labor force for this field of activity.

Priority I.2. Clothing industry

Importance. The textile market is changing, sometimes it also means closing the production capacities. One of the practices encountered in this industry is the lohn activity, representing a type of collaboration between economic actors (usually a foreign contractor who places an order and a local executor) aimed at optimizing the production costs for the contractor.

In the South-East Region, in 2018, the number of active local units in the textile manufacturing sector (CAEN Code 13) was of 133 companies, thus registering an increase of 37.11%, compared to 2014.

Market. In what concerns the exports, in the 2017-2018 period there was a positive trend with an increase of 3%, from 792 million euros in 2017 to about 816 million euros in 2018. The following textile product companies were identified in the South-East Region: Ring Textile Production Rtp SRL, Textbra SRL, Mistral Confezioni SRL, Artifex Focșani SRL, Conterra SA, SC Datsa Textil SRL, SC Sorste SA, SC Braiconf SA. Although they have efficient know-how and production equipment, the regional producers in the garment sector face difficulties in the availability of qualified human resources.

The intensity of innovation in the field. Although innovation in this area is low in the region, it can take place if there is a strategic approach that shifts from high-volume, low-value-added production to innovation-based production. Also, an important element for the development is the creation of clusters in the field.

Availability of qualified human resources in the field. In 2018, the average number of employees in the textile manufacturing industry was 2,203 people, mostly women, down 2.1% compared to

2014. An important role in the region is played by the vocational schools that offer qualification in the field.

Pillar II. Sustainble development through innovation.

Pillar objective: To support sustainable development in key areas of the region in order to improve the standard of living for all inhabitants of the region

Prority II.1 Agri-food and biotechnology field

Importance. In 2018, in the South-East Region there were 3,729 local units active in agriculture, forestry and fishing, most of them operating in Constanța County (980). The region also ranks second at national level in terms of the share of crop production and first in terms of the area under fruitful vineyards. In 2019, the region had the highest total grape production in the country, representing 42% of the total production.

The South-East region has an increased potential for rice cultivation, given the fact that in 1990 there were 15,477 ha of rice in the region, so that in 2019 they numbered only 7,427 ha. Through the South-East Region, at the level of which the Danube is also present, Romania is considered the country with the greatest development potential in the field of rice.

Among the arguments for supporting the need for the development of biotechnologies in the region can be listed: agri-food biotechnologies contribute to the conservation of natural resources, to reduce CO_2 emissions, to improve soil quality and high productivity; agri-food biotechnologies can provide products of increased quality and safety under more efficient use of resources and environmental protection; the economic contribution of biotechnology to agriculture at EU level is 36%; the use of biotechnology is estimated at 2030 to contribute to about 50% of agricultural production; environmental biotechnologies are effective in sustainable development based on reducing pollution; biodiversity must be conserved through biotechnologies; there is great potential for clustering in the field of environmental protection; the superior recovery of biodegradable waste and by-products by biotechnological processes can lead to increasing the level of well-being in the region, by creating new jobs and improved living conditions.

Market. Most agricultural companies are registered in the South-East Region. The demand for organic products is growing internationally, and at the regional level it is well developed.

The intensity of innovation in the field. In the South-East Region, the number of patent applications for vegetable and fruit varieties was the highest in Buzău County, followed by Constanța County. The irrigation system is essential for agriculture in the region, so the optimal

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use of conventional and unconventional water resources and mitigating the effects of climate change must become the practice of all stakeholders.

The research-innovation activities at the level of the region are carried out through the existing local companies, research stations and universities.

Availability of qualified human resources in the field. At the level of the region, in 2019, 13.7% of the employed people worked in the fields of agriculture, forestry and fishing. However, the average monthly salary was only 2,133 lei.

Nevertheless, studies show a chronic need for qualified staff and highly trained specialists in the field.

Priority II.2. Aquaculture and fishing field

Importance. At the level of the South-East Region the largest areas for aquaculture (65% of the national area) are concentrated. The fishing sector includes marine fishing activities on the Black Sea, and in inland waters (on the Danube and in the Delta area), aquaculture is included.

In terms of infrastructure, although it has been funded through the various dedicated operational programs, the infrastructure of fishing ports with specialized berths and storage facilities as well as the locations for organizing the first sale of fish are completely missing. The fishing fleet is also in an advanced stage of wear and tear.

Market. The amount of fish consumed at national level has increased in the recent years, but studies show that only 12% of national consumption is covered by domestic production. It is, therefore, an extraordinary development potential for this field. The total quantity of fish sold in Romania is 120,000 tons, annually. Out of these, 100,000 come from imports and only 20,000 are local production. From domestic production, 12,800 tons are obtained from aquaculture, 2,000 tons from the Black Sea and about 4,000 tons from inland waters.

The intensity of innovation in the field. Innovation in the field is low, but there are options to finance it through the Fisheries and Maritime Affairs Operational Program 2014-2020. In March 2019, the National Fisheries Network was operationalized, this being the structure that could boost the research-development and innovation activity in the field.

Availability of qualified human resources in the field. At national level, 4,574 professional fishermen and 2,968 fish farmers are active in the fishing field. Out of the total number of fishermen, 1,720 work in the Danube Delta, 2,215 on the Danube River, 168 on the accumulation lakes and 471 on the Black Sea. The lack of vocational, high school and post-high school institutions is causing a shortage of specialists in the region.

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Priority II.3. Tourism field

Importance. The South-East region includes almost all forms of relief: Danube Meadow, Bărăgan Plain, Dobrogea Plateau with Măcin Mountains, and the northwestern part of the region includes part of the Carpathians and Curburii Subcarpathians. The Danube crosses the region, forms the Delta, and the Black Sea covers the entire eastern part. Recently, the seaside tourism has been completed by spa and treatment tourism. The niche tourism (food, sports, adventure, history, nature, etc.) and wine tourism are also increasing. The number of tourist reception structures increased by 22.4% in the 2014 – 2020 period, Constanța County contributing with the highest number of new structures, followed by Tulcea County. If in 2014, at the level of the region, a total of 1,091,363 Romanian tourists arrived, at the level of 2019 there were 1,782,430 arrivals of Romanian tourists, representing an increase of 63.32%.

Market. At the level of the South-East Development Region, the index of net use of accommodation places on total tourist reception structures was in 2019 of 42.6, above the average registered in Romania of 34.2. The highest index was registered in Constanța county (49.3), followed by Brăila county (37.8), Tulcea county (31.9), Galați county (28.5), Vrancea (16.7) and Buzău (16.1).

The intensity of innovation in the field. The intensity of innovation in tourism in the South-East Region is low, with a low number of projects in this regard.

Availability of qualified human resources in the field. The tourism industry in the region is currently facing a shortage of well-skilled labor. There are schools with industry-specific programs, but also vocational training projects for employees such as: "EcoAdapt - Adapting employees to the dynamics of economic sectors with potential for smart specialization – South-East Region", "Qualification, Skills, Competitiveness in the South-East Region" or "Top Tourism Professionals (PRO TOP)".

PILLAR III. Smart society and regional economy through digital transformation

Pillar objective: To support the economic and social development of the region by applying new technologies in the key competitive areas.

Priority III.1. ICT - Information and communication technology

Importance. At the level of the South-East Development Region, in 2019, there were 1,514 enterprises in the field of Information and Communications, representing only 2.4% of the total enterprises registered in the region. The employed civilian population in the field of information and communications was 9,800 people, of which 4,500 women. The 9 clusters operating in the

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Market. The field is constantly evolving, the number of those who use the Internet is growing year by year. Household internet connections have also increased, with interaction with public authorities remaining low compared to the EU average. It is important to note that the South-East Region is making significant progress, being consistently among the top 3 at national level in terms of progress in this area.

The intensity of innovation in the field. The software park in Galați and the IT&C Cluster "Dunărea de Jos" Galați are important actors in the region that can contribute significantly to the development of the field. Supporting the implementation of information and communication technology (ICT) in the region can also be achieved by developing digital innovation centers (Digital Innovation Hub - IHL). Currently, there are 3 such centers in the region: CiTyInnoHub in Constața, Danube DIH in Galați and Digital Innovation Hub South East Romania.

Availability of qualified human resources in the field. The demand for labor can be covered by attracting graduates of university centers in the region.

SWOT Analysis

Strengths:	Weaknesses:
- GDP growth in the South-East Region, by 14.33%, between 2014 and 2017; - GDP/inhabitant growth, at the level of the South-East Region, in the 2014 - 2017 period; - Increase in GVA, by 20.66%, between 2013 and 2017; - Significant contribution of the regional GVA to the national GVA, in terms of the agriculture, forestry and fisheries sector and the construction sector (2nd place, respectively 3rd place at national level, in 2017); - Increasing the activity rate in the South-East Region, in the 2014-2019 period, from 63% to 68%; - Increasing the employment rate in 2019 compared to 2018 by 1 percentage;	- Decreasing the share of GDP of the Region in the national GDP, in the 2014 - 2017 period, from 11.26% to 10.26%; - The lower position occupied by the South-East Region at national level, in terms of regional GDP. Thus, in 2017, the region ranked 6th in terms of regional GDP, although in 2014 it was ranked 4th; - The existence of a relatively low value of regional GDP/inhabitant, South-East Region occupying, in 2017, the 5th position at national level; - Decreasing the share of GVA at the level of the South-East Region from GVA at national level, in 2017 compared to 2013 (from 11.26% to 10.24%);

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- Low unemployment rate registered in 2018, in Constanța County, below the existing average at national level (2.7%, compared to the national average of 3.3%);
- Increasing the number of local active units in the industry of professional, scientific and technical activities, from 4,473 units in 2014, to 5,407 active units in 2018;
- The increase by 42.69% of the number of newly created active enterprises, in the 2014-2018 period in the South-East Region;
- Presence of 7 higher education units in the region;
- In the 2014-2016 period, at the level of the South-East Region, the share of innovative enterprises was 16.9%, representing the highest level of innovation among all development regions of Romania;
- Existence and functioning of industrial clusters and parks, at the level of the South-East Region;
- Increasing the number of employees in the research-development activity, in the 2014-2018 period at the level of the South-East Region;
- The existence, on the territory of the South-East Region, of 5 research-development institutes;
- The existence, on the territory of the region, of the most important shipyards in Romania, respectively in Constanța, Midia, Mangalia, Brăila, Galați and Tulcea;
- The South-East region is an important agricultural area, with a tradition in this sector and geographical characteristics favorable to the practice of agriculture (the region ranks first in the country in terms of the area of fertile vineyards and has the second largest area in

- The decrease of the civilian active population of the South-East Region, in the 2014 - 2019 period, from 1,059.6 thousand people in 2014 to 997.8 thousand people in 2019 (representing a decrease of 5.8%);
- The region ranked, in 2019, on the last place at national level in terms of activity rate in urban areas;
- At the level of 2019, the South-East Region registered the highest unemployment rate at national level (6%);
- Slight decrease of the number of SMEs in the 2014-2018 period, at the level of the South-East Region, from 11.41% of the total number of SMEs at national level, in 2014, to 10.97%, at the level of 2018;
- At the level of 2019, the value of the average monthly salary in the South-East Region was below the national average (being 85.4% of the average net monthly salary registered at national level);
- Low rate of foreign direct investment in the South-East Region, at the end of 2018 (with a value of 4.2%, ranking the region on the 6th place at national level);
- At the level of 2018, the South-East Region was the region with the lowest expenditure on research and development, at national level.
- Decrease in the number of patents registered in 2019, at the level of the South-East Region, compared to the 2015-2018 period;
- Reduced innovation capacity of the South-East Region, according to the RCI index (European Regional Competitiveness Index);

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terms of the cultivation with the main crops - wheat, rye, corn, etc.);
- In the South-East Region, there are concentrated the largest areas for aquaculture (65% of the national area);
- The South-East region, due to its geographical characteristics, has a high tourist potential and on its territory coastal tourism, spa tourism, mountain tourism or niche tourism, such as viticulture, can be practiced.

- The South-East Region has a low competitiveness potential, according to the Competitive Potential Index, calculated at the level of 2017;
- Decrease of the number of innovative SMEs in the South-East Region by 8.73% and of the number of innovative large enterprises (LE) by 15.91%, between 2014 and 2016;
- Poor performance of the South-East Region in terms of digitization and widening gaps compared to other regions.

Opportunities:	Threats:
- Implementation of the National Strategy for Research, Innovation and Smart Specialization 2021-2027; - Existence of non-reimbursable funds for smart specialization and for digitization in the central public administration, through the Operational Program for Smart Growth, Digitization and Financial Instruments (OPSGDFI); - Implementation of the Just Transition Operational Program, for the most affected counties of the country, including Galati County (among the priorities of the program are the development of entrepreneurship, SMEs, research and innovation and digitalization); - Existence of non-reimbursable funds to finance smart specialization, including research, SME digitization, business support structures, innovation and technology transfer entities, digital innovation centers, SME production activity and for digitization in the central public administration, by accessing the ROP SE 2021-2027, Priority Axis 1 - A competitive region	- Manifestation of demographic phenomena of population aging and emigration, with an impact on the specialized labor force in the region; - Deepening the socio-economic gaps between the development regions and between the counties of the South-East Region; - Low degree of absorption of non-reimbursable funds for smart specialization, digitization, research, development and innovation; - Low interest of the private environment for investments in research - development and innovation activities.

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| through innovation, digitalization and dynamic enterprises;
• Involvement of the members of the quadruple helix in the development process of the South-East Region. | |

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Chapter II. Regional governance: ensuring participation and commitment

The partnership framework for the validation of information at regional level must be based on a bottom-up approach, in order to identify and analyze existing needs for research, development, technology transfer and digitization. In this sense, a number of institutional actors have been identified as having a significant impact on public policies that will be developed to support smart specialization.

Thus, the Ministry of Public Works, Development and Administration, through its specialized structure, ensures the operational coordination of Regional Operational Programs, while coordinating the process of developing regional strategies for smart specialization 2021-2027.

At the level of the South-East Region, RDA South-East will ensure the role of Managing Authority for the Regional Operational Program 2021-2027, based on this role managing the elaboration, implementation, monitoring and evaluation of SRSI SE, as well as its correlation with ROP 2021-2027. The Regional Planning, Programming and Monitoring Office within the RDA South-East elaborates the South-East Smart Specialization Regional Strategy, collects data/indicators for updating and monitoring the regional strategy, manages the monitoring and evaluation process of the South-East Smart Specialization Strategy, ensures the effective functioning of the entrepreneurial discovery process. Also, at regional level, three other structures are involved in the development of SRSI SE: the quadruple helix - a structure that meets in entrepreneurial discovery meetings and participates in the identification of project ideas and areas of smart specialization, the Regional Innovation Consortium of the South-East Region - consultative structure with the role of approving the South-East Regional Strategy for Smart Specialization, to carry out the project portfolio related to the strategy and to participate in monitoring the strategy, and the Regional Development Council - the deliberative regional body, with the role of approving the smart specialization of the region. Coordination between the regional and national levels regarding the smart specialization process will be achieved through the Smart Specialization Strategy Steering Committee (CCSI).

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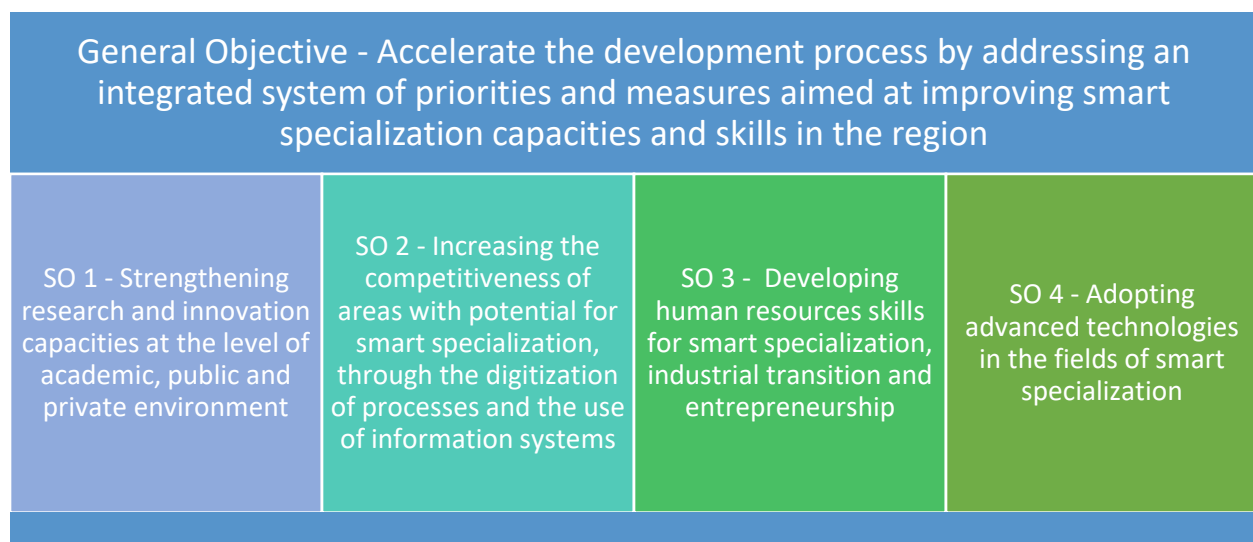
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Chapter III. Elaboration of a global vision for the future of the South-East Region

The aim of this strategy is to identify those areas in which the South-East Region can develop, by capitalizing on the results of research, innovation and science, so that it contributes significantly to increasing the competitiveness of the region and reducing its gap compared to the other development regions.

Vision - The South-East Region is aligned with national development trends and supports the improvement of the capacities and skills of academics, public and private and civil society to develop and implement integrated smart specialization actions, using a knowledge based approach.

The mission of the Regional Smart Specialization Strategy of the South-East Region 2021-2027 is to program and plan the proposed initiatives at the regional level, using an integrated and participatory approach, so that there is a favorable framework to generate the expected effects and results, in quantitative and qualitative terms, on smart specialization at the regional level.

The general objective aims to reduce the gap towards other development regions, by integrating the principles of smart specialization promoted by the European Union, while ensuring a favorable framework for key actors in the region who, by developing concrete action initiatives in the fields of smart specialization, produce a positive impact in relation to the sustainable development of the region.

General Objective - Accelerate the development process by addressing an integrated system of priorities and measures aimed at improving smart specialization capacities and skills in the region			
SO 1 - Strengthening research and innovation capacities at the level of academic, public and private environment	SO 2 - Increasing the competitiveness of areas with potential for smart specialization, through the digitization of processes and the use of information systems	SO 3 - Developing human resources skills for smart specialization, industrial transition and entrepreneurship	SO 4 - Adopting advanced technologies in the fields of smart specialization

The strategic objectives selected to achieve the general objective of the strategy pursue the policies set out by the European Union which support development towards a smarter Europe. Thus, the intervention logic aims to improve the following main aspects: 1. Research and innovation capacity, 2. Digitization, 3. Human resources, 4. Advanced technologies (KET), proposing the following strategic objectives, which aims to develop all areas of smart specialization identified at regional level:

SO 1 - Strengthening research and innovation capacities at the level of academic, public and private environment aims at supporting institutions involved in RDI activities by promoting funding opportunities for these activities, facilitating cooperation between entities and implementing projects. The objective is to actively support public-private partnerships in order to increase the level of cooperation in the field of RDI.

SO 2 - Increasing the competitiveness of areas with potential for smart specialization, through the digitization of processes and the use of information systems involves taking measures for digital transformation in the competitive areas identified in the South-East Region. The objective is based on the premise that, at present, competitive advantages cannot be achieved without the widespread use of information and communication technology.

SO 3 - Development of human resources skills for smart specialization, industrial transition and entrepreneurship. Through this objective, the training activities of the staff involved in RDI activities in the fields of smart specialization, both in the public and in the private sector, will be supported, encouraging entrepreneurial initiatives.

SO 4 - Adoption of advanced technologies (KET) in the fields of smart specialization. This objective proposes that, through concrete actions for supporting the financing of the adoption of advanced technologies, all areas of smart specialization become competitive at international level, given the great potential that exists at regional level.

Moreover, in the context in which the selected strategic objectives aim at developing all areas of smart specialization identified at regional level, the present strategy also identifies a series of operational objectives, which concretely capture the development of each area of smart specialization, through priorities, measures and actions, detailed at the level of the Action Plan.

The proposed operational objectives include:

- O.O.1 - Increasing competitiveness, developing innovative products and processes, in the engineering and shipping sector and in the clothing industry;
- O.O.2 - Development through innovation in the agri-food sector, bio-technologies, aquaculture, fishing and tourism;

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- O.O.3 - Development of the regional economy through digital transformation.

Chapter IV. Strategic priorities for smart specialization

The process of selecting the strategic priorities for smart specialization in the South-East Development Region took into account the detailed analyzes previously carried out in the process of establishing areas with high potential in the region. Thus, 7 priorities related to the areas of smart specialization identified at the level of the South-East Region and 4 transversal strategic priorities, applicable at the level of all areas of competitiveness, were established, as follows:

Strategic objective	Cross-cutting strategic priorities
SO 1 - Strengthening research and innovation capacities at the level of academic, public and private environment	1. Supporting the activity of the organizations that realize research-development and innovation activities
SO 2 - Increasing the competitiveness of areas with potential for smart specialization, through the digitization of processes and the use of information systems	2. Digital transformation by supporting the implementation of information and communication technology (ICT) at the level of smart specialization areas
SO 3 - Developing human resources skills for smart specialization, industrial transition and entrepreneurship	3. Supporting the activity of the organizations that realize research-development and innovation activities
SO 4 - Adopting advanced technologies in the fields of smart specialization	4. Supporting the application of Key Enabling Technologies (KET) at the level of smart specialization areas

Operational Objective	Strategic Priority	Smart specialization area
O.O.1 - Increasing competitiveness, developing innovative products and processes, in the engineering and	Strategic priority 1. Supporting the application of innovative solutions in ship design, construction and repair in order to minimize the negative impact on the environment	*Engineering and shipping*

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Operational Objective	Strategic Priority	Smart specialization area
shipping sector and in the clothing industry	Strategic priority 2. Development of smart transport systems through the digitization of ports and shipping	
	Strategic priority 3. Increasing the competitiveness of products and processes in the clothing industry through innovation	*Clothing industry*
O.O.2 - Development through innovation in the agri-food sector, bio-technologies, aquaculture, fishing and tourism	Strategic priority 4. Increasing the quality and quantity of food in the agri-food industry and biotechnologies	*Agri-food and biotechnology*
	Strategic priority 5. Re technologization in aquaculture and fisheries to support biodiversity and protect the environment	*Aquaculture and fishing*
	Strategic priority 6. Supporting the implementation of innovative solutions in the provision and promotion of tourism services	*Tourism*
O.O.3 - Development of the regional economy through digital transformation	Strategic priority 7. Support the adoption of SMART CITY solutions at the regional level	*Information and communication technology*

Chapter V. Defining the policy mix and action plan

Concrete actions have been defined for each priority related to the areas of smart specialization, but also actions for all areas of competitiveness, corresponding to the transversal strategic priorities. The impact of these policies aimed at boosting the innovation process depends very much on how it is implemented but also on the tools used.

The pilot projects, submitted by the key actors in the region working in the field of research, development and innovation, can contribute to the effective implementation of the smart specialization strategy and were selected according to the two criteria recommended in the RIS3 Guideline: relevance for priority areas of specialization and the expected short and medium-term impact.

The implementation of the Regional Smart Specialization Strategy of the South-East Region 2021 - 2027 will be realized for 7 (+2) years, between 2021 and 2029. This interval allows the correlation of the indicators established within the strategy with the program indicators monitored by the South-East RDA within the ROP 2021-2027.

The funding programs identified as relevant in the context of the implementation of this strategy are:

- Horizon Europe
- South-East Regional Operational Program 2021 - 2027
- Technical Assistance Operational Program 2021-2027
- Education and Employment Operational Program 2021-2027
- Just Transition Operational Program 2021-2027
- InvestEU Program 2021-2027
- Smart Growth, Digitization and Financial Instruments Operational Program (OPSGDFI)
- Digital Europe Program for the period 2021-2027

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Chapter VI. Integration of monitoring and evaluation mechanisms

The proposed mechanism for monitoring the strategy envisages the definition of 3 categories of indicators, as follows:

- Context indicators, which will facilitate the analysis of the positioning of the region in a national / European context;
- Result indicators, which will allow measuring the contribution to the overall objectives and verifying the direction of change in the proposed direction (and causes);
- Indicators of immediate achievement, which will allow measuring the progress of the actions taken.

The monitoring will be realized according to three levels:

1. **Level of the Strategy**: The progress in the implementation of the transversal priorities described at the level of the Smart Specialization Strategy of the South-East Region will be monitored.
2. **Level of smart specialization areas**: The indicators will be established to measure the degree of achievement of the specific objectives proposed in the strategy, at the level of each smart specialization priority.
2. **Level of strategic priorities**: The effect of implementing the measures set out in each strategic priority will be measured. In order to measure the impact, data will be collected both from the Annual Implementation Reports (RAI) of the National Operational Programs for the period 2021-2027, as well as from the monitoring data and published statistics related to the financing programs managed at EU level (Ex: Horizon Europe 2021-2027).

There will be 2 key milestones for the evaluation process, respectively 2025 and 2029, at the level of which it is proposed to elaborate the Interim Evaluation of the implementation of the Smart Specialization Strategy of the South-East Region - aiming to analyze the degree of implementation of the proposed measures realized in 2025, and the implementation of the ex-post evaluation of SRSI SE, which will be realized in 2029 and will take into account the evaluation of the results recorded by implementing the measures proposed to achieve strategic priorities.

In order to carry out the monitoring and evaluation of SRSI SE, a series of context indicators were proposed - developed to reflect changes in the economic and socio-demographic context of the region, result indicators - related to specific objectives and achievement indicators - related to the 7 strategic priorities and 4 cross-cutting priorities.