# Euro-Mediterranean Network Facilitating Market Uptake of Innovations from SME

## Challenges & Priorities Identification

## Table of Contents

# 1. Introduction

The present document is developed under **Activity  Challenges & Priorities Identification report drafting,** in the framework of the EMPHASIS project. The deliverable aims at the identification of sectors challenges and priorities that will be target in the EMPHASIS Open call.

The consolidated report is developed by the PP5 (STPS), with the contribution of LP (KiNNO), containing the input produced by the Project Partners (KiNNO, STPS, IRI, CEEBA, ASCAME, JUST).

The report identifies the main Challenges & Priorities aimed to design tools for providing the service to the SMEs. In order to do that a regional and national database has been realized by the Emphasis partners to identify the SME's needs, challenges, opportunities, threats & obstacles.

Further, the key stakeholders and cluster in each country has been identified following the triple helix model of innovation based on interactions between academia (the university), industry and government, to foster economic and social development, which will be used by  Focus Groups experts.

This report is an Emphasis regional synthesis with national data, policies and SWOT elaborations for EuroMediterranean countries involved in Emphasis project and the roles played by Research & Technology Organisations (RTOs), Intermediaries, Business Support Structures, Cluster of SMEs, Public Sector which stimulate the access of SMEs to external knowledge and up taking of research findings.

## 2. Methodology

In order to collect data of innovation ecosystems planned in the WP 3 (Design & Setup o EMPHASIS Open Innovation Network & Services), the partners have used the following methodology:

- information on economic, research, political, institutional, and other factors that influence the development, diffusion and use of innovations;
- aspects of the economic structure and the institutional contest;
- elements on institutional infrastructure supporting innovation within the production structure of the region.

The innovation ecosystem represent one important main root in the related concept of business ecosystems.

So the following point has been developed by the all the partners:

- A description of the national and regional areas;
- The importance of regional economic areas;
- The relevant innovative productive sector;
- The main Sector and thematic areas;
- A description of the policy context ;
- A SWOT analysis of the innovation system.

All the information collected will be useful in order to extract challenge and priorities for stimulating SMEs accessing extern al knowledge and uptaking of innovation & internationalization opportunities.

## 3. Lead Partner: Knowledge and Innovation Consultants Symvouleftiki monoprosopi epe – KiNNO - Greece

***Brief description of the national innovation ecosystem***

Greece with a population of approximately 11.000.000 people is the country under consideration. Greece is well known for its extensive coastal waterways and its geographic location that have traditionally served as a gateway to the central Balkans and the Middle East as well as a passage to the Black Sea.

Greece is a **Moderate Innovator** with strengths particularly in **Innovators**, **Linkages** and **Employment impacts**. The three best indicators include the **Sales of innovative products**,

**Innovative SMEs collaborating with others**, and **Product innovators.** Greece has above average shares of In-house product innovators and is showing close to average scores on the Climate change related indicators.

According to the National Documentation Center[1], during the three years 2014-2016, 57.7% of Greek companies innovated, thus increasing business innovation by 6.7 points from the three years 2012-2014 and 5.4 units from the three years 2010-2012 (Chart 15). The increase refers to product / process and organization / marketing innovations. **99.9% of Greek companies are SMEs** and represent 63.5% of the total value added (EU average 56.4%) and their share in employment is equal to 87.9% (EU average 66.6 %).

In addition, about 40% of the Gross Value Added of the Greek economy in the two years 2018-2019 comes from sectors that do not present such high specialization, production of innovations, Research and Development activities, use of new technologies and internationalization (**Real Estate, Public Sector, Wholesale**) . However, following in the ranking are branches that present some of the above characteristics such as e.g. Manufacturing, Tourism, Transportation-Storage, Health-Social Welfare, Primary Sector etc. Some of these sectors are showing an increase in their share of Gross Value Added in recent years (**Tourism, Transport-Storage, Primary sector**). The largest contribution of the innovative activities of Greek innovative companies concerned "**Agro-Nutrition & Food Industry**" in 21.7% of companies with product and / or process innovation. It is followed by the sector of "**Information & Communication Technologies**" with 19.3%, the "**Materials - Constructions**" with 17.7% and the sector of "**Transport & Supply Chain**" with 16.1%. The most widespread branch of activity of Greek start-ups is that **of Health and related applications**, where it has shown growth of 16.16% in the last two years in the Greek ecosystem of start-ups. They are followed by the sectors of **Retail and E-Commerce**, the sector of **Entertainment** (sports, fashion, social networks, etc.), **Energy and Infrastructure**, **Tourism**, which has managed to maintain stable levels of growth despite the impact of the pandemic, **Agri-Food, ICT and Transport**. In the Elevate Greece database, 55 of the registered start-ups are active in the **Natural Sciences sector** (MedTech, HealthTech, BioTech), 35 in the **Environment and Energy sector**, 35 start-ups are active in **the Tourism sector**, 28 in the **Food and Agri-Food**, 18 in **Shipping and Supply Chain and Transport** and 18 in **Manufacturing**.

Regarding the innovation actors in Greece, Elevate Greece is the official platform and the leading resource for in-depth information on the Greek Startup Innovation Ecosystem. The platform is a database of Greek startups, innovation actors and innovation initiatives. The Community Actors of the Greek Startup Innovation Ecosystem, gathered in Elevate Greece, consists of Science Parks and Technology Transfer organizations, Innovation Clusters, Incubators, VCs, Accelerators, Coworking Spaces and Federations supporting the evolution and growth of startups. There are 534 Greek startups registered to the Elevate Greece platform so far. (Figure 1). Other relevant actors are: Industrial Property Organisation, Elevate Greece, Hellenic Industrial Property Academy (Business Angels' Co-Investment Fund), EquiFund, National Bank of Greece "Business Seeds", "Egg" (Enter-Grow-Go), Invent ICT, IDGC (Industry Disruptors-Game Changers), European Institute of Innovation and Technology - EIT, etc.

The **new Research and Innovation Strategy for the period 2021- 2017** will focus on:

Agri-food Chain

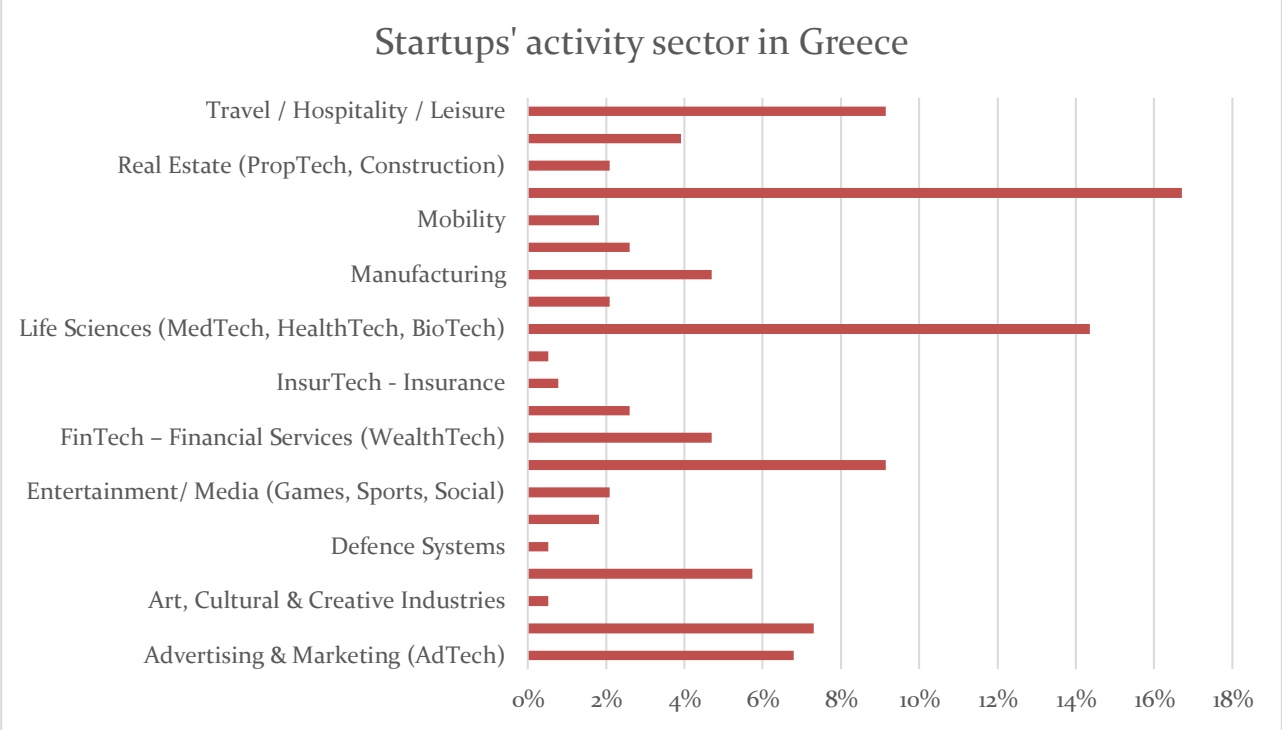
Life Sciences-Health-Medicines

[1] https://metrics.ekt.gr/innovation

Digital Technologies
Sustainable Energy
Environment and Circular Economy
Transport & Supply Chain
Materials-Constructions & Industry
Tourism, Culture and Creative Industries

The Entrepreneurial Discovery Process[2] under the RIS have emerged proposal in some areas regarding the areas of intervention and the relevant priorities which will be the subject of public consultation in the coming months, which are strongly related to the SDGs[3].

In particular, a table with the SDGs intervention per goal related to the emerged sectors of the RIS 2021-2027 for Greece is presented below (the Blue Economy sectors has been added due to the importance of the sector in Greece):




## *Brief description of the regional innovation ecosystem*

In Greece's case, Attica is the region that is considered representative of Greece's economic characteristics and strengths. The Region of Attica is the Athens metropolitan area and borders the Region of Central Greece, with about 3,787,386 inhabitants, is the capital of the Regional Administration of Attica and the Decentralized Administration of Attica. The region is divided into 66 municipalities.

[2] http://www.gsrt.gr/central.aspx?sId=128I509I1380I323I528340
[3] https://www.un.org/development/desa/disabilities/envision2030.html

The productive structure of the region includes a small primary sector with the lowest GDP share across the country that is based on the agricultural and livestock sector. The region has a modest presence of the secondary sector and regarding the industrial activity, a large part of it, is relocated outside the regional borders, near to the region because of environmental restrictions. Finally, the tertiary sector has a high share in regional GDP. Attica has developed a strong specialization in sectors such as information and communication, in professional, scientific and technical activities, and in financial and insurance activities.

Compared to the OECD[4] regions, Attica is having a relatively high score in safety, health and education and very low scores in terms of community, environment, access to services, and jobs. When compared to the other Greek regions, Attica is above the national average in education, civic engagement, and income, close to the national average in health, community, jobs, housing, and life satisfaction, below the national average in safety, environment, and access to services. In addition, the **R&D Expenditures** in the case of Attica are **higher** compared to the national average, a performance that is similar in all sub-categories of expenditure.

During the previous Regional Strategy of Smart Specialization for Attica ,the targeted sectors was on the Medicine / Health, Energy (RES, energy saving, Smart Grids), Environmental Technology, Intelligent and Sustainable Transport, ICT, New Materials, Agri-food, Shipbuilding, Tourism, Culture-Media, Design intensity branches (crafts, clothing, furniture). During this period the main emphasis was given to the sectors of Creative Economy and Sustainable Economy of Needs.

The Regional Strategy of Smart Specialization of the Attica Region for the period 2021-2027 will remain the same but will mostly focus on:

- **Medicine and Health, Energy-Environment, Smart Cities, New Materials, Space Technologies, Micro-nano electronics, and design intensity.**
- **Aquatic Biotechnology, Intelligent and Sustainable Shipping, and integrated management of tourist destination, the field of specialization of the Blue Economy**.

The main objective is to strengthen the innovative activity in three general areas of smart specialization, with important opportunity for Attica: Creative economy, Blue economy, Sustainable Economy of Needs.

As mentioned above the Regional Research and Innovation Strategy of Attica focuses on the same sectors of the national one and targeting the sectors as following:

Agri-food Chain: ✓

Life Sciences-Health-Medicines: **Medicine and Health**

Digital Technologies: **Micro-nano electronics, and design intensity. Space Technologies**

Sustainable Energy: **Smart Cities**

Environment and Circular Economy: **Energy-Environment**

Transport & Supply Chain: ✓

Materials-Constructions & Industry: **New Materials, Space Technologies, and design intensity.**

Tourism, Culture and Creative Industries: **integrated management of tourist destination, the field of specialization of the Blue Economy**

Blue Economy: **Intelligent and Sustainable Shipping, Aquatic Biotechnology**

[4] https://www.oecd.org/greece/oecdterritorialreviews-athensgreece.htm

Regarding the innovation actors, all types of the quadruple helix cam be found in Athens. Most of the Innovation stakeholders, universities, funds, startups/SMEs and national institutions are based in Athens.
Important Public investments and European Structural Funds that benefits the Region of Attica are the following: Public Investment Program, European Structural Funds, ESPA Regional Operational Program, ESPA Sectoral Operational Programs.

### *Economic areas of regional importance*

The sectors that contribute to the regional economy include **tourism, manufacturing, mining, real estate, maritime services, logistics, financial services, hi-tech and life sciences, agribusiness and wholesale and retail trade**[5]. In addition, the port of Piraeus, located near the center of the city, is the top 1st busiest container terminal in the Mediterranean and one of the top 10 in Europe, offering many opportunities in the region and making it a major transshipment center.
According to the Enterprise Greece[6], the investments opportunities in the Attica region are coming from the sectors of:
- Creation of modern, integrated facilities for treating and disposing municipal solid waste
- Selective collection at source and further recycling of municipal waste
- Construction of suitable transfer station networks and recycling centres
- Environmental sound management of industrial, medical and hazardous waste
- Rehabitation of the existing landfills
- Energy recovery from organic waste
- Water treatment and sea or brackish water desalination
- Wastewater and sewage treatment

**Logistics** (Peiraeus Port, skilled labor, Presence of global Logistics Providers, Triassio Freight Complex, etc.)
**Food & Beverage** (Key area products (honey, wine, fruits, olives, nuts))
**Tourism** (Medical Tourism, Eco Tourism, Agrotourism, Cultural Tourism, Developing of existing state and private assets)

### *Production systems with greater innovative potential in the region*

As stated before, the economy of Attica includes a small primary sector, a noteworthy secondary sector, and a large tertiary sector. The primary sector is based on **agriculture and livestock** and exhibits low levels of relative productivity. The secondary sector is, mainly, based on **labor-intensive industries** (such as printing and publishing, on **capital-intensive industries** (such as transport equipment), **on resource-intensive industries** (such as coke and petroleum) and on **knowledge-intensive industries** (such as pharmaceutical products, chemicals, electronic equipment and optical instruments) and exhibits satisfactory levels of relative productivity. The tertiary sector is, mainly, based **on information and communication technologies**, on **professional, scientific and technical activities**, on **financial and insurance activities**, and on **administrative and support services**, and exhibits modest levels of relative productivity[7].

[5] https://www.enterprisegreece.gov.gr/images/public/pdf-files/region-profiles/Attica.pdf
[6] https://www.enterprisegreece.gov.gr/en/attica-investment-profile
[7] https://www.espa.gr/el/Documents/2127/Regional_profiles_gr.pdf

## *Brief description of Sectors/ thematic areas/ with sustainability spin*

According to the Greek Research and Innovation Strategy for the period 2021- 2017, the 17 Sustainable Development Goals and the regional Research and Innovation Strategy, the following sectors and challenges have been identified per targeted sector:

**Agri-food chain**:

-Development of sustainable food production systems and resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather conditions, drought, flooding and other disasters and that progressively improve land and soil quality

- Solutions to reduce food losses along production and supply chains, including post-harvest losses
- Solutions to regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics

**Sustainable Energy:**

- Solutions increase substantially the share of renewable energy in the global energy mix
- Solutions to upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes.
- Solutions enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management
- Solutions for sustainable and resilient buildings utilizing local materials

**Environment and Circular Economy:**

- Solutions increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity
- Solutions reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.
- Solutions to reduce waste generation through prevention, reduction, recycling and reuse
- -Sustainable solutions to be adopted and integrated to the reporting cycle of companies, especially large and transnational companies.
- Solutions to strengthen resilience and adaptive capacity to climate-related hazards and natural disasters

**Digital Technologies**

**Blue Economy:**

- Solutions to reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.
- Solutions to sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans.

***Brief description of Policies context (1-2 par) at EU, Country and regional level, priorities, OI, sustainability (Green Deal, etc.)***

The most important EU strategies related to the sustainability sector are the following:
**EU Cohesion Policy 2021-2027**[8] priorities:
1. a more competitive and smarter Europe
2. a greener, low-carbon transitioning towards a net zero carbon economy
3. a more connected Europe by enhancing mobility
4. a more social and inclusive Europe
5. Europe closer to citizens by fostering the sustainable and integrated development of all types of territories

**European Green Deal** aiming at improving the well-being of people and making Europe climate-neutral and protecting our natural habitat will be good for people, planet and economy[9] by providing:
-fresh air, clean water, healthy soil and biodiversity
-renovated, energy efficient buildings
-healthy and affordable food
-more public transport
-cleaner energy and cutting-edge clean technological innovation
-longer lasting products that can be repaired, recycled and re-used
-future-proof jobs and skills training for the transition
-globally competitive and resilient industry

**SHAPING EUROPE'S DIGITAL FUTURE**[10] and **Digital Europe**[11] **focusing on 3 main objectives:**
1. Technology that works for people
2. A fair and competitive economy
3. An open, democratic and sustainable society

**European industrial strategy**[12] which aims at**:**
Strengthening of the resilience of the Single Market
Supporting Europe's Open Strategic Autonomy through dealing with dependencies
Supporting the business case for the twin transitions

Regarding the national regulation and policies, Greece is designing its strategies in line with the EU strategies. A key action plan for Greece is the "Plan for the Development of the Greek Economy[13]" published in 2020 is linked with eight (8\0 National Strategies and National Action Plans:
1. The National Energy and Climate Plan:

[8] https://ec.europa.eu/regional_policy/en/policy/how/priorities
[9] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en
[10] https://ec.europa.eu/info/sites/default/files/communication-shaping-europes-digital-future-feb2020_en_4.pdf
[11] https//digital-strategy.ec.europa.eu/en/activities/digital-programme
[12] https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-industrial-strategy_en
[13] https://www.kathimerini.gr/wp-content/uploads/2020/11/growth_plan_2020-11-23_1021.pdf

2. The Digital Bible
3. The National Strategic Transport Plan
4.The National Strategy for Higher Education
5. The Greek Youth Guarantee Scheme
6. The National Action Plan for Gender Equality 2021-2025
7. The National and Territorial Plans for a Fair Transition
8. Roadmap for the Circular Economy

In addition, Greece will adopt the EU policy Cohesion Plan through the NSRF 2021-2027, which includes the same strategic objectives, plus the specific objective of the"**Just Transition Development Plan of lignite areas**"[14] , which is based on five development pillars, as follows: Clean energy, Industry and trade, Smart agricultural production, Sustainable tourism, Technology and education. It includes enhanced investment incentives to attract investments, as well as specific land uses for the tens of thousands of acres of land of lignite fields being released.

Another important national Plan is the "Greece 2.0 – National Recovery and Resilience Plan[15]", which includes 6 major objectives:
- Transition to a new environmentally friendly energy model
- Digital transformation of the governant operations
- Digital transformation of enterprises
- Enhancing the digital potential of education and modernizing vocational education and training
- Promoting research and innovation
- Modernization and improvement of the resilience of the main sectors of the country's economy

Finally, the National Development Plan for 2021-2025[16] includes specific objectives related to Smart Growth, Green Growth, Infrastructure development, Social Growth, Extroversion.

***SWOT Analysis of the innovation ecosystem of the Region***

| **Key innovation strengths and weaknesses of the region** | **strengths** | **weaknesses** | **Notes** |
|---|---|---|---|
| | | | |
| INNOVATION INPUTS INSTITUTIONS | | | put X in the strengths or in the weaknesses column in every row; leave it blank if it is the case |
| | | | |
| Political environment | X | | |

[14] https://www.enterprisegreece.gov.gr/en/invest-in-greece/just-transition
[15] https://www.minfin.gr/documents/20182/9976964/Greece+RRP+GR.pdf/6d9f7032-1bb7-4f69-b092-fa7136b8a1a6
[16] http://epa.gov.gr/?page_id=503

| | | | |
|---|---|---|---|
| Political and operational stability | | X | |
| Government effectiveness | X | | |
| Regulatory environment | X | | |
| Regulatory quality | X | | |
| Rule of law | | X | |
| Cost of redundancy dismissal, salary weeks | X | | |
| Business environment | X | | |
| Ease of starting a business | X | | |
| Ease of resolving insolvency | | X | |
| | | | |
| HUMAN CAPITAL & RESEARCH | | | |
| Education | X | | |
| Expenditure on education, % GDP | X | | |
| Government funding/pupil, secondary, % GDP/cap | X | | |
| School life expectancy, years | X | | |
| PISA scales in reading, maths, & science | X | | |
| Pupil-teacher ratio, secondary | X | | |
| Tertiary education | X | | |
| Tertiary enrolment, % gross | X | | Highest ranking |
| Graduates in science & engineering, % | X | | |
| Tertiary inbound mobility, % | X | | |
| Research & development (R&D) | | X | |
| Researchers, FTE/mn pop | | X | |
| Gross expenditure on R&D, % GDP | | X | |
| Global R&D companies, avg exp top 3, mn $US | | X | |
| QS university ranking, average score top 3* | X | | |
| | | | |
| | | | |
| INFRASTRUCTURE | | | |
| Information & communication technologies (ICTs) | | X | |
| ICT access* | X | | |
| ICT use* | | X | |
| Government's online service* | X | | |
| E-participation* | X | | |
| General infrastructure | | X | |
| Electricity output, kWh/mn pop | | X | |
| Logistics performance* | X | | |
| Gross capital formation, % GDP | X | | |
| Ecological sustainability | | X | |
| GDP/unit of energy use | | X | |
| Environmental performance* | X | | |

| | | | |
|---|---|---|---|
| ISO 14001 environmental certificates/bn PPP$ GDP | X | | |
| | | | |
| MARKET SOPHISTICATION | | | |
| Credit | | X | |
| Ease of getting credit | | X | |
| Domestic credit to private sector, % GDP | | X | |
| Microfinance gross loans, % GDP X | | X | |
| Investment | X | | |
| Ease of protecting minority investors | | X | |
| Market capitalization, % GDP X | | X | |
| Venture capital deals/bn PPP$ GDP | | X | |
| Trade, competition, and market scale | X | | |
| Applied tariff rate, weighted avg, % | X | | |
| Intensity of local competition | X | | |
| Domestic market scale, bn PPP$ | | X | |
| BUSINESS SOPHISTICATION | | | |
| Knowledge workers | | X | |
| Knowledge-intensive employment, % | X | | |
| Firms offering formal training, % | X | | |
| GERD performed by business, % GDP | X | | |
| GERD financed by business, % | X | | |
| Females employed w/advanced degrees, % | X | | |
| Innovation linkages | | X | |
| University/industry research collaboration | | X | |
| State of cluster development | | X | |
| GERD financed by abroad, % GDP | | X | |
| JV-strategic alliance deals/bn PPP$ GDP | | X | |
| Patent families 2+ offices/bn PPP$ GDP | X | | |
| Knowledge absorption | | X | |
| Intellectual property payments, % total trade | | X | |
| High-tech imports, % total trade | | X | |
| ICT services imports, % total trade | X | | |
| FDI net inflows, % GDP | X | | |
| Research talent, % in business enterprise | | X | |
| KNOWLEDGE & TECHNOLOGY OUTPUTS | | | |
| Knowledge creation | X | | |
| Patents by origin/bn PPP$ GDP | | X | |
| PCT patents by origin/bn PPP$ GDP | | X | |
| Utility models by origin/bn PPP$ GDP | | X | |
| Scientific & technical articles/bn PPP$ GDP | X | | |
| Citable documents H-index | X | | |
| Knowledge impact | X | | |

| | | | |
|---|---|---|---|
| Growth rate of PPP$ GDP/worker, % | | X | |
| New businesses/th pop 15-64 | | X | |
| Computer software spending, % GDP | | X | |
| ISO 9001 quality certificates/bn PPP$ GDP | X | | |
| High- and medium-high-tech manufacturing, % | X | | |
| Knowledge diffusion X X | X | | |
| Intellectual property receipts, % total trade | X | | |
| High-tech net exports, % total trade | X | | |
| ICT services exports, % total trade | | X | |
| FDI net outflows, % GDP | | X | |
| CREATIVE OUTPUTS | | | |
| Intangible assets | | X | |
| Trademarks by origin/bn PPP$ GDP | | | No data |
| Global brand value, top 5,000, % GDP | | X | |
| Industrial designs by origin/bn PPP$ GDP | | X | |
| ICTs & organizational model creation | X | | |
| Creative goods and services | X | | |
| Cultural & creative services exports, % total trade | X | | |
| National feature films/mn pop 15-69 | X | | |
| Entertainment & Media market/th pop 15-69 | X | | |
| Printing and other media, % manufacturing | X | | |
| Creative goods exports, % total trade | X | | |
| Online creativity | X | | |
| Generic top-level domains (TLDs)/th pop 15-69 | | X | |
| Country-code TLDs/th pop 15-69 | | X | |
| Wikipedia edits/mn pop 15-69 | X | | |
| Mobile app creation/bn PPP$ GDP | | X | |

| **Strengths** | **Weaknesses** |
|---|---|

| | |
|---|---|
| - Quality of University and Research Centre<br>- High number of research centers,<br>- universities and knowledge transfer capacity strengthening extroversion – increasing of exports<br>- 1st in the world seafaring shipping in number of ships and tonnage<br>- internationally competitive tourism sector<br>- favor agricultural production,<br>- the production of energy from RES due to favorable climatic conditions and the adequacy of water resources<br>- rich cultural and religious heritage of the country with significant benefits of investing in culture<br>- strong geostrategic position of the country makes it an important gateway to and from Europe and enables it to approach many markets for its products<br>- accelerating the digitization of many public and private sector processes due to the health crisis<br>- Attracting foreign investment in recent years in the field of Digital Technologies<br>- High quality and internationally competitive scientific potential in various fields (health, pharmaceutical industry, energy production, digital technologies, materials-constructions, environment-circular economy, etc.)<br>- Digitalization of enterprises<br>- Potentials in developing cooperation between them in the field of innovation<br>- Dynamic start-up ecosystem in the field of digital technologies<br>- IT industry and the pharmaceutical industry have managed to successfully utilize outsourcing for their integration into global value chains | - Productive gap compared to its capabilities and a long-term trade deficit<br>- Use of energy-intensive production processes and high dependence of the country on energy imports (oil, gas)<br>- Small businesses are low in productivity and competitiveness and their size does not allow them to take advantage of economies of scale<br>- Decline in the value added of the industry to the total value added of the country<br>- Production is mainly oriented towards non-tradable sectors<br>- Lower level of spending in R&D by SMEs<br>- Limited technological maturity of Greek SMEs<br>- Limited cooperation between companies and research centers and universities<br>- Need of upgrade of the railway network, port and logistics infrastructure<br>- Weaknesses in the institutional framework of the sectors of Sustainable energy<br>- weaknesses in financing the sectors of Sustainable energy<br>- Strategic weaknesses in many sectors (agri-food, Sustainable energy, Environment-Circular economy, Health, Digital technologies, Materials-Construction, Tourism, Creative industries<br>- Networking weaknesses in many sectors (agri-food, Sustainable energy, Environment-Circular economy, Health, Digital technologies, Materials-Construction, Tourism, Creative industries<br>- Weaknesses in relation to human resources (eg brain drain, skills shortages, aging, etc.) |
| **Opportunities** | **Threats** |
| - Strengthening the international value of the country due to its geographical location<br>- Major number of natural resources available<br>- Increase in the inflows of Foreign Direct Investments in the country contributing to employment and Research and Development<br>- Increasing interest in acquisitions and mergers in sectors such as telecommunications, energy, food and beverages, pharmaceuticals and shipping<br>- Significant resources available in the coming years from the Recovery Fund for the digital transformation of the economy, the green transition and private investment<br>- EU goals for increasing innovation, digital investment and R&D | - Consequences of pollution and climate change<br>- Migration / refugee flows<br>- The geopolitical tensions in the Eastern Mediterranean region<br>- Aging of the country's population due to the low birth rate<br>- Brain drain with negative effects on the adequacy of human resources<br>- Risk of a prolonged international recession due to the health crisis or other unforeseen factors<br>- Delayed adaptation of the country's productive sector to the requirements of the 4th Industrial Revolution<br>- Delayed adaptation of digitalization processes in the public and private sector |

| | |
|---|---|
| - Internationally emerging trends require technological solutions in areas where the country is developing significant action<br>- Significant opportunities for high value-added synergies between different sectors of the economy<br>- possibility of connecting digital technology with traditional sectors of the economy | - Delayed adaptation to highly competitive trade and technological development conditions<br>- Vulnerability to fluctuations in energy prices due to lack of security of energy supply<br>- Rising energy costs (oil, gas) for businesses and households |

## Partner PP1: Jordan University for Science and Technology – JUST - ENI South-Jordan

### *Brief description of the national innovation ecosystem*

Jordan's national innovation ecosystem system has been described as a 'traffic jam' of organizations characterized by duplication and dilution of effort. The development of a national 'ecosystem' that stimulates science, technology and innovation (STI) offers Jordan an excellent opportunity to ensure future economic development and the welfare of its citizens. The national innovation system establishes matches the research and development coming out of universities and research centers with the needs of the private sector related to gaps in industry and technology intelligence. It connects private sector resources to applied research needs, promote technical cooperation between SME service providers in Jordan including those who provide access to finance; business development services; workforce productivity and vocational training, and promote innovation outreach to academia and scientific institutions through forming oncampus University and Research Center Innovation Facilities. The national innovation system takes care of monitoring and Evaluation that harnesses data utilizing the custom IT platform that supports SME data and aggregated innovation data related to national efforts and private sector growth. Key performance indicators (KPIs) that reflect national innovation strategies for developing an innovation-based economy will be tracked. Challenges in Jordan's Innovation Landscape are: 1) Innovation is poorly defined and measured. Innovation promotion is misidentified as enterprise support, leading to misallocation of public resources away from actual innovation, and innovation metrics that are either not collected or are of questionable relevance. 2) Innovation strategy and information are poorly coordinated. Innovation stakeholders do not respond to national development priorities and innovation information systems (to the extent that they exist) are not interoperable with their international peers. 3) Commercialization opportunities are missed. There is a broad failure to identify, track, and encourage commercialization of research, to affect knowledge transfer across institutional or sectoral boundaries, and to engage with multinational and global centers of research excellence. 4) The innovation value chain has key gaps Policy, funding, and incubation spaces are crowded but misaligned to innovation needs. Knowledge transfer and information management are underserved.

### *Economic areas of regional importance*

Jordan economy depends on Jordan's economic resource base centers on phosphates, potash, and their fertilizer derivatives; tourism; overseas remittances; and foreign aid. These are its principal sources of hard currency earnings. The statistic shows the distribution of the gross domestic product (GDP) across economic sectors in Jordan from 2010 to 2020. In 2020, agriculture contributed around 5.2 percent to the GDP of Jordan, 23.91 percent came from the industry and 61.59 percent from the services sector. Jordans green economic initiative will enhance social integration, economic growth an environmental sustainability within one focused, measured and stable economic plan. Jordan is a small country that is rich in human capital; the green journey will be a twenty year program to retrofit the infrastructure, to become energy, water and resource efficient. Jordan's stability is severely challenged by socio-economic hardship. The country is plagued by high un-employment rates, an alarming debt-to-GDP ratio of around 94 percent, corruption, and dismal social ser-vices. Sustainable development prioritizes key areas of concern for Jordan. Economically, Jordan imports over 90% of its food and energy from regional allies like Saudi Arabia and the UAE, and receives aid from those countries along with the UN and United States. This heavy reliance on imports and aid is due in part to Jordan's scarce access to natural resources. The joke goes to that Jordan has less water than oil – and it has no oil. Because of this dependance, Jordan's economy is vulnerable to changes in other countries' willingness to give aid and partner in trade. This is especially pronounced in times of economic downturn or when oil prices fluctuate. Sustainable development practices, such as building clean energy, would be a way out of this conundrum because Jordan would not need to rely on other countries' resources. Socially, amidst a war-torn region and with a population that is nearly half-refugee from Syria, Iraq, or Palestine, social sustainability and stability are extremely important for Jordan. Jordan has relied on aid from foreign partners to keep costs of living low and people happy, but, similar to their economy, this reliance on foreign countries is dangerous in the long-term. Lastly, climate change poses a threat to Jordan. Rising temperatures are predicted to decrease the country's already limited water supply. Additionally, Jordan's scarce agricultural soil has been overworked, and protecting this soil would ensure that Jordan's land is sustainable for future generations. In every category, sustainable development makes sense for Jordan, which is why the country has approached it so aggressively since 2000. Jordan began pursuing sustainable development in 2000 as one of the first countries to adopt the Millennium Development Goals. The country's experience since then has demonstrated a limitation of the development strategy: on a nation-wide scale, sustainable development requires the ability to make substantial financial investments and focus on the long-term. During times of economic growth, like the mid-2000s, Jordan was able and willing to invest in the long-term sustainability of the country. Since the 2008 global financial crisis and start of the Syrian refugee crisis, though, Jordan has not been able to focus on sustainable development as a priority.

## *Production systems with greater innovative potential in the region*

The horticultural sector in Jordan is undergoing a crisis, due to a decline in export. Innovation can improve the performance of the sector. To this end, the government of Jordan should pursue an innovation policy with the Agricultural Knowledge and Innovation System (AKIS) as object of the governance. Based on a review of the AKIS in Jordan it is proposed that a Living Lab setting be used to gain experience with the management of a number of innovation projects and capacity building projects. The Kingdom of Jordan, and especially its horticultural sector, faces challenging times. The political instability in neighbouring countries has not only resulted in a large flow of refugees, especially from Syria, but also a loss of markets. The war in Syria has blocked the export of fruit and

vegetables to the east of Europe, including Russia, as road traffic has become impossible. This has led to a collapse of prices in the home market. Such an innovation and capacity development policy should promote a sustainable, internationally competitive and inclusive sector, with products for high-end markets, high water use efficiency and the capacity to continuously innovate in terms of technology, products, services and markets. The further development of the present support projects in innovation and capacity building could be bundled into a four-year comprehensive programme that enables Jordan to make concrete and big steps forward in making innovation and continuous capacity development in horticulture systemic. This will result in a sector with a significantly improved international competitive position, moving towards a much higher water use-efficiency and offering gainful employment opportunities for a large number of people. This transformation in making capacity development and innovation the core of the development strategy requires concerted actions of both the commercial sector and the government. Jordan has made significant achievements over the past decades, witnessing economic, social, human and political transformations encompassing all areas of life. These developments have translated into tangible improvements in education and health, and the availability of comprehensive quality infrastructure and services covering transportation, electricity, communications, water supply security and municipal services. The economic growth rates during the first decade of the millennium reached about 6.5%, translating into decent work opportunities and improved living standards for all citizens. Jordan was one of the first countries globally, and in the Arab Region, to take action towards the attainment of the Millennium Development Goals (MDGs). Overall, considerable achievements were made during the first ten years, especially in the areas of poverty eradication, maternal and child health, communicable diseases, universal primary education, and environmental sustainability. Abject poverty was reduced from 6.6% to less than 0.5%. The infant mortality rate was reduced from 34 per 1,000 live births in 1990 to 17 per 1,000 live births in 2012 while the under-five mortality rate was reduced from 37 per 1,000 live births to 21 per 1,000 live births over the same period. Maternal mortality rates were significantly lowered from 48 per 100,000 live births in 1992 to 19 per 100,000 live births in 2008. Universal primary education was achieved for boys and girls alike in 2005. Jordan is facing complex challenges as a result of the geo-political environment of the region and the chronic water scarcity that it has traditionally experienced. The increase in population has placed a further strain on the very limited water resources of the country. Water management in Jordan has focused on prioritizing supplying water for human consumption. The country has reviewed its development plans and strategic options within the context of other crucial resources, i.e., the production of food and generation of energy to ensure a better understanding of the water-food-energy nexus. Almost all Jordanians have access to safe drinking water, estimated at 94% through water supply networks. However, the daily per capita water consumption is low; average consumption is 74.7 litres/person/day and the government is working to raise this to approximately 122.6 litres/person/day by 2030. Jordan acknowledges that culture is a driver and enabler of sustainable development and essential for achieving the 2030 Agenda as it contributes to human and socio-economic development, quality education, social inclusion, sustainable cities, environmental sustainability and peaceful societies.

***Brief description of Sectors/ thematic areas/ with sustainability spin***

Indeed, energy is central to the growth of the Jordanian economy, which relies on imports to meet energy needs. This reliance strains the economy and poses energy supply security risks. These

vulnerabilities drove the development of the Master Energy Strategy 2007 2020, which called for greater utilisation of domestic resources, including renewable energy. The share of electricity from renewables in Jordan grew from 0.7% in 2014 to over 13% in 2019, making Jordan a regional front-runner in renewable energy. The country has established the necessary policies and regulations to support renewables, including solar photovoltaic (PV) and onshore wind development. The updated Master Strategy for the Energy Sector 2020-2030, developed by the Ministry of Energy and Mineral Resources (MEMR), calls for a sustainable future energy supply, diversification of the national energy mix, increased dependency on the share of domestic energy resources, enhanced energy security, and reduced energy dependence and cost of electricity supply. The strategy targets a 31% share for renewables in total power generation capacity and 14% of the total energy mix by 2030. Jordan's most abundantly available renewable energy resources are solar and wind, with smaller potentials for bioenergy, hydropower and geothermal. The Renewable Energy and Energy Efficiency Law No. 13 of 2012 and its amendments form the backbone of Jordan's policy landscape for renewable energy and energy efficiency. Bylaw (79) year 2019 for Climate Change set requirements for stakeholders to report greenhouse gas emissions. Jordan's nationally determined contribution (NDC) commits to a 14% reduction in greenhouse gas emissions by 2030. The NDC's actions include developing and utilising renewable energy sources. In addition, the Green Growth National Action Plan 2021-2025 (GG-NAP) was created to expand on Jordan's climate and sustainable development ambitions by mainstreaming green growth, climate change, and sustainable development objectives into sectoral strategic frameworks. Sector-level action plans were developed for each of the priority green economy sectors: Agriculture, Energy, Tourism, Transport, Waste, and Water.

***Brief description of Policies context (1-2 par) at EU, Country and regional level, priorities, OI, sustainability (Green Deal, etc.)***

Jordan has been a frontrunner among the Mediterranean partners to embark on new association ties with the EU. The European Community and Jordan first established contractual relations in 1977 by signing a Cooperation Agreement. Both the 1997 Association Agreement (which entered into force in May 2002) and the European Neighbourhood Policy (ENP) Action Plan, adopted in 2005, contributed significantly in developing the bilateral relations. These are three milestones in our bilateral relations each one of them marking a clear step forward in the process of strengthening ties. The European Union and Jordan have progressively built over the years a strong and constructive partnership which is now about to enter into a new phase. Moving towards an "advanced status" relationship stems from the common objective of promoting peace, stability and prosperity and based on the core values the EU and Jordan share, i.e. democratic principles including the rule of law and the respect for human rights. This new Action Plan gives

concrete substance to the “advanced status” partnership. The ENP will continue to play a catalyst role as a single policy framework, based inter alia on partnership and joint ownership, as well as performance-driven differentiation and tailor-made assistance. The revised European Neighbourhood policy 1 adopted in November 2015 sets a new framework to define bilateral relations with partners. These should be captured in a political document defined as "Partnership Priorities" that are a key point of reference with partner countries in agreeing on a limited set of targeted priorities for the coming years. The negotiation with Jordan took place in the spirit of the London conference of February 2016 "for Syria and the region", where the Commission and the HRVP proposed the definition of mutual commitments to help countries hosting the largest influx of Syrian refugees (Jordan and Lebanon). The concept is in line with the new Global Strategy for the European Union's Foreign and Security Policy 2 , presented in June 2016 by the High Representative whereby the complete EU tool box is used in the most efficient manner to increase impact and visibility of Union support. It was agreed between the EU and Jordan that the "Partnership Priorities" document will have as annex a "Compact" defining he respective EU and Jordan commitments. These documents will be the basis for the programming of EU assistance. The "Partnership Priorities and Compact" reflect shared interests and focus on areas where co-operation between the EU and Jordan is of mutual benefit. It is in that light that the EU and Jordan are committed to furthering cooperation on cross-cutting issues ranging from stabilization and security to rule of law and human rights, gender equality and empowerment of women, dialogue with civil society, migration and mobility, addressing violent extremism. The main political priorities identified in EU-Jordan relations for the coming years are:

–Strengthening cooperation on regional stability, security including counter-terrorism;
–Promoting economic stability, sustainable and knowledge-based growth, quality education and job creation;
–Strengthening democratic governance, the rule of law and human rights.

The annexed "Compact" focuses on strengthening the economic resilience of Jordan while enhancing economic opportunities for Syrian refugees, through increased protection and access to employment and quality education, promoting sustainable use of natural resources.

***SWOT Analysis of the innovation ecosystem of the Region***

| **Key innovation strengths and weaknesses of the region** | **strengths** | **weaknesses** | **Notes** |
|---|---|---|---|
| | | | |
| INNOVATION INPUTS INSTITUTIONS | | | put X in the strengths or in the weaknesses column in every row; leave it blank if it is the case |
| | | X | |
| Political environment | | X | |
| Political and operational stability | | | |
| Government effectiveness | | X | |
| Regulatory environment | | X | |
| Regulatory quality | X | | |
| Rule of law | X | | |
| Cost of redundancy dismissal, salary weeks | | X | |

| | | | |
|---|---|---|---|
| Business environment | | X | |
| Ease of starting a business | | X | |
| Ease of resolving insolvency | | X | |
| | | | |
| HUMAN CAPITAL & RESEARCH | | | |
| Education | X | | |
| Expenditure on education, % GDP | | X | |
| Government funding/pupil, secondary, % GDP/cap | | X | |
| School life expectancy, years | X | | |
| PISA scales in reading, maths, & science | X | | |
| Pupil-teacher ratio, secondary | X | | |
| Tertiary education | X | | |
| Tertiary enrolment, % gross | X | | |
| Graduates in science & engineering, % | X | | |
| Tertiary inbound mobility, % | X | | |
| Research & development (R&D) | | X | |
| Researchers, FTE/mn pop | | X | |
| Gross expenditure on R&D, % GDP | | X | |
| Global R&D companies, avg exp top 3, mn $US | | X | |
| QS university ranking, average score top 3* | | X | |
| | | | |
| | | | |
| INFRASTRUCTURE | | | |
| Information & communication technologies (ICTs) | X | | |
| ICT access* | X | | |
| ICT use* | X | | |
| Government's online service* | X | | |
| E-participation* | X | | |
| General infrastructure | X | | |
| Electricity output, kWh/mn pop | X | | |
| Logistics performance* | X | | |
| Gross capital formation, % GDP | | X | |
| Ecological sustainability | | X | |
| GDP/unit of energy use | | | |
| Environmental performance* | | X | |
| ISO 14001 environmental certificates/bn PPP$ GDP | | | |
| | | | |
| MARKET SOPHISTICATION | | | |
| Credit | | X | |
| Ease of getting credit | | X | |

| | | | |
|---|---|---|---|
| Domestic credit to private sector, % GDP | | X | |
| Microfinance gross loans, % GDP X | | X | |
| Investment | | X | |
| Ease of protecting minority investors | X | | |
| Market capitalization, % GDP X | | X | |
| Venture capital deals/bn PPP$ GDP | | X | |
| Trade, competition, and market scale | | X | |
| Applied tariff rate, weighted avg, % | | X | |
| Intensity of local competition | | X | |
| Domestic market scale, bn PPP$ | | X | |
| BUSINESS SOPHISTICATION | | | |
| Knowledge workers | | X | |
| Knowledge-intensive employment, % | | X | |
| Firms offering formal training, % | | X | |
| GERD performed by business, % GDP | | X | |
| GERD financed by business, % | | X | |
| Females employed w/advanced degrees, % | | X | |
| Innovation linkages | | X | |
| University/industry research collaboration | | X | |
| State of cluster development | | X | |
| GERD financed by abroad, % GDP | | X | |
| JV-strategic alliance deals/bn PPP$ GDP | | X | |
| Patent families 2+ offices/bn PPP$ GDP | | X | |
| Knowledge absorption | | X | |
| Intellectual property payments, % total trade | | X | |
| High-tech imports, % total trade | | X | |
| ICT services imports, % total trade | | X | |
| FDI net inflows, % GDP | | X | |
| Research talent, % in business enterprise | | X | |
| KNOWLEDGE & TECHNOLOGY OUTPUTS | | | |
| Knowledge creation | X | | |
| Patents by origin/bn PPP$ GDP | | X | |
| PCT patents by origin/bn PPP$ GDP | | X | |
| Utility models by origin/bn PPP$ GDP | | X | |
| Scientific & technical articles/bn PPP$ GDP | | X | |
| Citable documents H-index | | X | |
| Knowledge impact | | X | |
| Growth rate of PPP$ GDP/worker, % | | X | |
| New businesses/th pop 15-64 | | X | |
| Computer software spending, % GDP | | X | |
| ISO 9001 quality certificates/bn PPP$ GDP | | X | |
| High- and medium-high-tech manufacturing, % | | X | |
| Knowledge diffusion X X | | X | |

| | | | |
|---|---|---|---|
| Intellectual property receipts, % total trade | | X | |
| High-tech net exports, % total trade | | X | |
| ICT services exports, % total trade | | X | |
| FDI net outflows, % GDP | | X | |
| CREATIVE OUTPUTS | | | |
| Intangible assets | | X | |
| Trademarks by origin/bn PPP$ GDP | | X | |
| Global brand value, top 5,000, % GDP | | X | |
| Industrial designs by origin/bn PPP$ GDP | | X | |
| ICTs & organizational model creation | | X | |
| Creative goods and services | | X | |
| Cultural & creative services exports, % total trade | | X | |
| National feature films/mn pop 15-69 | | X | |
| Entertainment & Media market/th pop 15-69 | | X | |
| Printing and other media, % manufacturing | | X | |
| Creative goods exports, % total trade | | X | |
| Online creativity | X | | |
| Generic top-level domains (TLDs)/th pop 15-69 | | X | |
| Country-code TLDs/th pop 15-69 | | | |
| Wikipedia edits/mn pop 15-69 | | | |
| Mobile app creation/bn PPP$ GDP | X | | |

## *Strengths and weaknesses of the Jordanian system of innovation*

| **Preceived strength** | **Frequency** | **%** | **Preceived weaknesses** | **Frequency** | **%** |
|---|---|---|---|---|---|
| Development in education and human resources development | 15 | 100 | Lack of umbrella with a long-term for innovation | 15 | 100 |
| Orientation the state to support science, technology and innovation | 11 | 73 | Multiplicity of innovation program between the various institutions | 12 | 80 |
| Advanced intellectual property environment | 7 | 47 | Weakness of university – industry relationship | 11 | 73 |
| Natural advantages | 4 | 27 | Bureaucracy | 10 | 67 |
| | | | Weak entrepreneurial spirit and fear of risk | 9 | 60 |

| | | | | | |
|---|---|---|---|---|---|
| | | | The weak efficiency of the Jordanian market size index | 5 | 33 |

# 4. Partner PP2: Association of the Mediterranean Chambers of Commerce and Industry - ASCAME - SPAIN - CATALONIA

***Brief description of the national innovation ecosystem***

The entrepreneurship ecosystem, specifically for innovation and disruptive business models, is experiencing its best moment to date in Spain. While 2019 was already a landmark year in terms of the creation of new, technology-based startups, and the rise of VC investment accordingly, the ecosystem has continued to grow these last two years despite the Covid-19 pandemic, and it has even reached new heights. In the year 2020, amidst an economic landscape unlike any other in recent times, there were in Spain more investment deals involving startups than in any other year before, with a notable increase in early-stage rounds.

Innovation is gaining strength in the Spanish economy as a whole. According to data from the National Institute of Statistics (INE), Spain has recorded three consecutive years of investment growth in RDI, and a higher rate of growth than nominal GDP.

Support in forming and establishing startups from both the public and private sectors is apparent from the start in business accelerators and incubators. There are over 180 infrastructures of this type throughout Spain that offer advice and support for entrepreneurs.

The Spanish market is very receptive to business innovation. According to the 2019 European Innovation Scoreboard, Spain scores high in sales impact/sales of new-to-market and new-to-firm innovations, which measures the turnover generated by new products and products being ranked second in Europe. Business has contributed decisively to R&D, with an 8.2% increase in investment. Substantial investments by multinational companies established in Spain account for 38.4% of total business assets. Public investment is recovering, and last year saw a 3.3% increase.

Spain stands out in open innovation initiatives. Major Spanish corporations work in a wide range of industries. From ICT to energy, finance and retail, they have the ability to combine the university's educational and scientific efforts with the business ecosystem, since most of them have their own startup programmes.

Spain ranks fourth among countries in the European Union that receive most European funds for innovation projects. Private funding has also practically doubled. As a result of Spain's leadership in science and innovation in Europe, the country has received 43 million euros in projects financed by Horizon 2020, and is the first country to win these grants in the last two awards.
Spain has an advantageous tax system for RDI thanks to tax deductions established by law for this type of activity, which is an incentive that multinationals rate highly when setting up their RDI in the country (Multinationals in Spain study, Business Climate in Spain survey, Nov. 2018). The importance of SMEs in RDI private investment is especially noteworthy.

**Actors: public funding for RDI**:
- **The Industrial Technology Development Centre (CDTI)** offers a wide range of subsidies and loans for technology projects at competitive interest rates.
- **The public organization RED.ES** promotes programmes to foster the digital economy, innovation, entrepreneurship and support for SMEs by encouraging the efficient and intensive use of Information and Communication Technologies (ICTs).
- **The Spanish National Research Council (CSIC)** is the largest public institution in Spain devoted to scientific and technical research and one of largest in the European Research Area. It is attached to the Ministry of Science and Innovation through the General Secretariat for the Coordination of Scientific Policy. Its mission is to promote, coordinate, develop and disseminate scientific and technological research with a multidisciplinary focus in order to advance knowledge and economic, social and cultural development, and to train staff and advise public and private bodies in these areas.
- **The National Innovation Company (ENISA)** funds SMEs with up to 1.5 million euros in participation loans and with no guarantee required.
- **The Ministry of Science and Innovation** is responsible for promoting scientific and technical research, development and innovation, with various R&D-centred programmes.
- **Invest in Spain/ICEX** has a programme that supports foreign companies with up to 200,000 euros for investments, having a major R&D component and a competitive bidding procedure.
*Source: ICEX*

## *Brief description of the regional innovation ecosystem*

In accordance with datas from the Government of Catalonia, Barcelona is Southern Europe's most dynamic startup ecosystem, being home to over 1,300 startups that mostly develop their activity in the fields of Industry 4.0 (17%), life sciences (13%) and mobile & software technologies (11%). According to the **Barcelona & Catalonia Startup Hub**, the startup economy in Catalonia employs 13,820 people. The international feel of the city translates into the figures: 26% of all employees are from abroad, mainly from Western Europe (46%) followed by South America, Eastern Europe, Asia, Africa and North America. In addition, 15% of startup founders are international.
Barcelona is the third favorite hub in Europe to stablish a startup, just after London and Berlin, according to Startup Heatmap Europe 2018. As per business model, 45% of Catalan startups have ecommerce & marketplace as business models. Development and manufacturing comes next (23%), and SaaS (22%) takes third position having increased 5% from 2016.
Nowadays Barcelona lies 4th in the ranking of European cities by volume of investment received: the city raised €722M in 2017, only behind London, Berlin and Paris.

Some key actors: LetGo, Glovo, TravelPerk.

**Regional Strengths**: With **7,7 million inhabitants** and a surface area of **32,108 square kilometers**, Catalonia is a diverse territory, with extensive mountains, inland depressions, and a coastline that stretches for 214 km. Catalonia is very rich in **natural scenery**, with 18 sites declared to be natural parks and protected areas. **Barcelona** is among the most visited cities in Europe. Catalan culture, architecture and history have developed its own unique and universal identity over the centuries. Historically a **trading nation**, Catalonia's economic activity has always depended on its ability to connect to the rest of the world. Its location in the Mediterranean and its transport infrastructures, as well as its trading, entrepreneurial and open economy have made it a **top rank strategic position in the south of Europe** with Barcelona as an unbeatable meeting point for international business.

Spanish FDI legislation has adapted its foreign investment rules to a system of general liberalization, applying the principles of **free establishment and non-discrimination**, which means that foreign investors may not be treated differently to Spanish investors, regardless of size or type of investment.

The main incentive programmes offer both preferential grants and loans for business projects in the following: R&D and innovation, training, energy efficiency, investment in fixed assets, and job creation with further incentives available for international activities.

*Source:* Catalonia *Startup Hub*

### *Economic areas of regional importance*

Including sustainability aspects, considering that *the concept* of *sustainability is composed of three pillars:* ***economic, environmental, and social****—also known informally as* ***profit, planet,*** **and people**

**Economic:**

- 12.8% Food & Beverage
- 11.1% Chemicals
- 10.5% Motor vehicles

Environmental:

- Digital tool for green public purchasing and procurement (GPPP), created by Barcelona Metropolitan Area (AMB)

Social

- Women farmers' initiative

### *Brief description of Sectors/ thematic areas/ with sustainability spin*

**Material efficiency**: providing material services with less material production and processing.

Some initiatives:

- **Fostering green public procurement within the Administration**: aims to manage and encourage environmental criteria in contracting, as established in the Government Agreement of 9th December 2009, to systemise responsible consumption within the Catalan Administration, to increase the number of Government of Catalonia tender documents that include eco-efficiency and ecoinnovation criteria, to increase corporate competitiveness and opportunity in Catalan businesses that offer products or services with eco-efficient or eco-innovative criteria, to increase the competitiveness of businesses with environmentally accredited products or services, to export this model to the private sector.

- A digital tool for green public purchasing and procurement (GPPP): To foster sustainability criteria in public procurement by introducing environmental criteria in the purchasing and procurement of products and services, as established in the EMA Sustainability Plan 2008-2012 and in the current Barcelona Metropolitan Area (AMB) Sustainability Plan (PSAMB) 2011-2015.

**Sanitation**: public health conditions related to clean drinking water and treatment and disposal of human excreta and sewage.

Use of reclaimed water in the Barcelona Metropolitan Area: aims to reduce hydric stress in the Llobregat Delta and replace drinking and pre-drinking water with reclaimed water wherever possible. For this reason, the following facilities have been built: A water reclamation plant (WRP) to produce water according to potential non-drinking water demand in the metropolitan area; The basic distribution network to take water to as many consumption points as possible, for the greatest possible consumption of this type of water.

## *SWOT Analysis of the innovation ecosystem of the Region*

| **Key innovation strengths and weaknesses of the region** | **strengths** | **weaknesses** | **Notes** |
|---|---|---|---|
| | | | |
| INNOVATION INPUTS INSTITUTIONS | | | put X in the strengths<br>or in the weaknesses column in every row;<br>leave it blank if it is the case |
| | | | |
| Political environment | | X | |
| Political and operational stability | | X | |
| Government effectiveness | | | |
| Regulatory environment | | | |
| Regulatory quality | | | |
| Rule of law | | | |
| Cost of redundancy dismissal, salary weeks | | | |
| Business environment | X | | |
| Ease of starting a business | X | | |
| Ease of resolving insolvency | X | | |
| | | | |
| HUMAN CAPITAL & RESEARCH | | | |
| Education | X | | |
| Expenditure on education, % GDP | X | | 3.67 % GDP in 2018 |
| Government funding/pupil, secondary, % GDP/cap | | | |
| School life expectancy, years | X | | 18.9 years (2017-18) |
| PISA scales in reading, maths, & science | | | Reading: 477 (reading) |
| Pupil-teacher ratio, secondary | | X | 12.9 (2012-13) |
| Tertiary education | | | |
| Tertiary enrolment, % gross | | | |
| Graduates in science & engineering, % | | | |
| Tertiary inbound mobility, % | | | |

| | | | |
|---|---|---|---|
| Research & development (R&D) | | | |
| Researchers, FTE/mn pop | | | |
| Gross expenditure on R&D, % GDP | X | | 1.44 % GDP in 2019 |
| Global R&D companies, avg exp top 3, mn $US | | | |
| QS university ranking, average score top 3* | | | |
| | | | |
| | | | |
| INFRASTRUCTURE | | | |
| Information & communication technologies (ICTs) | X | | It is one of the key sectors in Catalonia |
| ICT access* | X | | |
| ICT use* | X | | |
| Government's online service* | X | | |
| E-participation* | X | | |
| General infrastructure | X | | |
| Electricity output, kWh/mn pop | | | |
| Logistics performance* | X | | |
| Gross capital formation, % GDP | | | |
| Ecological sustainability | X | | |
| GDP/unit of energy use | | | |
| Environmental performance* | X | | |
| ISO 14001 environmental certificates/bn PPP$ GDP | | | |
| | | | |
| MARKET SOPHISTICATION | | | |
| Credit | | | |
| Ease of getting credit | X | | |
| Domestic credit to private sector, % GDP | X | | |
| Microfinance gross loans, % GDP X | | | |
| Investment | X | | |
| Ease of protecting minority investors | | | |
| Market capitalization, % GDP X | | | |
| Venture capital deals/bn PPP$ GDP | | | |
| Trade, competition, and market scale | X | | |
| Applied tariff rate, weighted avg, % | | | |
| Intensity of local competition | X | | |
| Domestic market scale, bn PPP$ | X | | |
| | | | |
| BUSINESS SOPHISTICATION | | | |
| Knowledge workers | | | |
| Knowledge-intensive employment, % | X | | 36% in Spain |
| Firms offering formal training, % | | | |

| | | | |
|---|---|---|---|
| GERD performed by business, % GDP | X | | R+D 1,41 % GDP 2020 |
| GERD financed by business, % | | | |
| Females employed w/advanced degrees, % | X | | 95,1% - Twenty years after graduation, the employment rate for both sexes is very similar and close to 100%. |
| Innovation linkages | X | | Barcelona is a city that hosts many innovations initiatives in Europe. |
| University/industry research collaboration | X | | |
| State of cluster development | X | | Barcelona is very strong in creating clusters in different sectors. |
| GERD financed by abroad, % GDP | | | |
| JV-strategic alliance deals/bn PPP$ GDP | | | |
| Patent families 2+ offices/bn PPP$ GDP | | | |
| Knowledge absorption | | | |
| Intellectual property payments, % total trade | | | |
| High-tech imports, % total trade | X | | 10,4% T3/2021 |
| ICT services imports, % total trade | | | |
| FDI net inflows, % GDP | X | | 3,8% T2/2021 |
| Research talent, % in business enterprise | | | |
| | | | |
| KNOWLEDGE & TECHNOLOGY OUTPUTS | | | |
| Knowledge creation | X | | Catalan government aims to foster the creation and consolidation of a new, high value-added, knowledge-intensive entrepreneurial ecosystem. |
| Patents by origin/bn PPP$ GDP | | | |
| PCT patents by origin/bn PPP$ GDP | | | |
| Utility models by origin/bn PPP$ GDP | | | |
| Scientific & technical articles/bn PPP$ GDP | | | |
| Citable documents H-index | | | |
| Knowledge impact | | | |
| Growth rate of PPP$ GDP/worker, % | | | |
| New businesses/th pop 15-64 | | | |
| Computer software spending, % GDP | | | |
| ISO 9001 quality certificates/bn PPP$ GDP | | | |
| High- and medium-high-tech manufacturing, % | | | |
| Knowledge diffusion X X | | | |
| Intellectual property receipts, % total trade | | | |
| High-tech net exports, % total trade | | | |
| ICT services exports, % total trade | | | |
| FDI net outflows, % GDP | | | |
| | | | |
| CREATIVE OUTPUTS | | | |

| | | | |
|---|---|---|---|
| Intangible assets | | | |
| Trademarks by origin/bn PPP$ GDP | | | |
| Global brand value, top 5,000, % GDP | | | |
| Industrial designs by origin/bn PPP$ GDP | | | |
| ICTs & organizational model creation | | | |
| Creative goods and services | X | | Barcelona has a very consolidated creative industry . |
| Cultural & creative services exports, % total trade | | | |
| National feature films/mn pop 15-69 | | | |
| Entertainment & Media market/th pop 15-69 | | | |
| Printing and other media, % manufacturing | X | | The production of the cultural industries is highly concentrated in two sectors: books and press, and audiovisual and multimedia, which in 2009 contributed 48% of the sector's Gross Value Added, although this contribution has been reduced in recent years. |
| Creative goods exports, % total trade | X | | In Catalonia, exports of cultural goods represent around 1% of total exports. exports |
| Online creativity | | X | |
| Generic top-level domains (TLDs)/th pop 15-69 | | | |
| Country-code TLDs/th pop 15-69 | | | |
| Wikipedia edits/mn pop 15-69 | | | |
| Mobile app creation/bn PPP$ GDP | | | |

| **Strengths** | **Weaknesses** |
|---|---|
| • Quality of University and Research Centre<br>• Very consolidated innovative sector, with high level innovation in SMEs<br>• 45% of Catalan startups have ecommerce & marketplace as business models<br>• The investment in R&D is higher than in the next regions<br>• High number of highly skilled professionals in Engineering and Science<br>• Top rank strategic position in the south of Europe<br>• Favorable foreign investment rules | • Lack of effective connection between industry and research due to bureaucratic, organizational and cultural problems that impede an effective cooperation between companies and the public system of R&Ds.<br>• Weak public and private financial support for R&D<br>• High number of research centers, universities and knowledge transfer capacity |
| ***Opportunities*** | **Threats** |
| • Innovative sector in Catalonia employs 13,820 people | • Economic crisis caused by Covid19<br>• The effects of political uncertainty |

| | |
|---|---|
| • Barcelona is the third favorite hub in Europe to stablish a startup<br>• Increasing interest in fostering R&D associations and collaboration.<br>• Attraction of high level, highly educated and prepared human capital<br>• Internationalization of local SMEs. | • Cost of separatist challenge<br>• High rates of early school leavers<br>• Business getaway |

## 5. Partner PP3: Industrial Research Institute - IRI - LEBANON

### *Brief description of the national innovation ecosystem*

After a rapid rise of the ecosystem, the main actors supporting innovation have shrunk across the years. The reason being the economic and financial situation the country is enduring. There are still actors like ELCIM, Berytech, The Asher Center (USEK), and a few others. There is a focus on tech related innovation covering many sectors, from the pure ICT approaches (AI, Data mining, etc.) to applied fields like agritech, fintech, energy, sustainability, etc.
Approaches to the development of innovation goes through different activities: Ideation, incubation, accelerator, hackathon, co-financing, voucher systems, mentoring to name the most important ones.
Figures are hard to come by because statistics are not properly collected.
At the national level, there are no clear current strategies on how to develop innovation. Most activities are done by private entities, academia, and NGOs. At the national level, there are some activities like that of the CNRS (Lira project), but as mentioned nothing is done amidst a clear and defined innovation strategy program.
The strength of the sector is due in part to the good quality of education delivered at the University level, this allows for students and later on entrepreneurs to emerge with strong foundation and knowledge. Then, thanks to the few organizations available in the country, they can use these as springboards to approach external markets, and outside financing.
Financing in Lebanon has slowed down tremendously because of the financial and economic crisis, leaving most entrepreneurs in a survival mode, and looking for opportunities beyond the borders.

### *Brief description of the regional innovation ecosystem*

The country is too small to work at a regional level. The preceding national system applies.

### *Economic areas of regional importance*

Currently there are a couple areas of importance for the country: import substitution and search for export opportunities. As we are experiencing a hyperinflation and a de facto devaluation of the Lebanese Pounds, importing goods has become an extremely onerous proposition that the majority of Lebanese cannot afford anymore. Because of the economic recession coupled with financial restrictions, industries are trying to also find ways to export in order to generate foreign currency which are in extremely short supply in the country.

Agrifood is a very important sector as it needs to feed a local population that has difficulties sourcing food. Many companies and entrepreneurs are looking at developing local production without depending on imports. In agri-food all sectors are concerned.
Energy has also become an important aspect, because of the end of subsidies on fuel and gas, the prices have hugely soared putting a large share of the population in a dire situation, not affording generator-produced electricity. The national grid has been deficient and unable to deliver electricity to the population. A situation that was bad before and has now become extremely difficult.
The area of technology (ICT) has always been a vibrant one but here the objective is more about international or regional reach in order to grow the sector as local purchasing power has plummeted.

***Brief description of Sectors/ thematic areas/ with sustainability spin***

Food: import substitution, sourcing of cheaper food staples, potential export.
Water: water collection and access to clean water to service the agricultural needs and the population; private wastewater treatment facilities to substitute the lack of water treatment public infrastructures.
Energy: photovoltaic and other sources of renewable energy to substitute the failing national electricity grid system.
Waste : waste treatment facilities and encourage waste sorting to contribute in reducing waste and palliate the shortage of public initiatives in the sector.
Circular economy: Private initiatives in the waste recycling ( plastic – cardboard- metal ). They are not part of a global strategic plan or directives. (Not set at national level)
ICT : outsourcing of ICT services in different subsectors ( banking ; insuretech ; fintech etc…) ; increase of ecommerce activities and services as a result of Covid pandemic and national financial crisis.
In view of Lebanon's economic and financial situation, there are two priorities: give access to the local market to services and opportunities are getting difficult to access and generate revenue from international operations bringing an inflow of fresh currency in the economy.
For EdTech SMEs the aim would be to serve and provide learning and training services to under served markets: rural areas which are in more need of education as in the past, new segment of the population that can afford sending their children to school/university because of the huge loss of purchasing power. The second area would be scalable project serving an international market through innovative solutions.

For FinTech SMEs, the aim would be first local to serve people who don't have access to banking services due to the stricter capital control and the reduction of services given. It would also be within payment mobile payment systems to bypass the local banking system. And finally, like in EdTech, it could serve an international market using innovative technology.

This could help narrow down the application in both sectors with a direct impact locally. It can also become interesting to benefit from international stakeholders to partner and bring the projects to a higher level, and scale up.

***SWOT Analysis of the innovation ecosystem of the Region***

| **Key innovation strengths and weaknesses of the** | **strengths** | **weaknesses** | **Notes** |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **region** | | | |
| | | | |
| INNOVATION INPUTS INSTITUTIONS | | | put X in the strengths<br>or in the weaknesses column<br>in every row;<br>leave it blank if it is the case |
| | | X | |
| Political environment | | X | |
| Political and operational stability | | X | |
| Government effectiveness | | X | |
| Regulatory environment | | X | |
| Regulatory quality | | X | |
| Rule of law | | X | |
| Cost of redundancy dismissal, salary weeks | | X | |
| Business environment | | X | |
| Ease of starting a business | | X | |
| Ease of resolving insolvency | | X | |
| | | | |
| HUMAN CAPITAL & RESEARCH | | | |
| Education | X | | |
| Expenditure on education, % GDP | | X | |
| Government funding/pupil, secondary, % GDP/cap | | X | |
| School life expectancy, years | X | | |
| PISA scales in reading, maths, & science | | X | |
| Pupil-teacher ratio, secondary | | X | |
| Tertiary education | X | | |
| Tertiary enrolment, % gross | X | | |
| Graduates in science & engineering, % | X | | |
| Tertiary inbound mobility, % | | X | |
| Research & development (R&D) | | X | |
| Researchers, FTE/mn pop | | X | |
| Gross expenditure on R&D, % GDP | | X | |
| Global R&D companies, avg exp top 3, mn $US | | X | |
| QS university ranking, average score top 3* | | X | |
| | | | |
| | | | |
| INFRASTRUCTURE | | | |
| Information & communication technologies (ICTs) | X | | |
| ICT access* | | X | |
| ICT use* | X | | |
| Government's online service* | | X | |
| E-participation* | | X | |

| | | | |
|---|---|---|---|
| General infrastructure | | X | |
| Electricity output, kWh/mn pop | | X | |
| Logistics performance* | | X | |
| Gross capital formation, % GDP | | X | |
| Ecological sustainability | | X | |
| GDP/unit of energy use | | X | |
| Environmental performance* | | X | |
| ISO 14001 environmental certificates/bn PPP$ GDP | | X | |
| | | | |
| MARKET SOPHISTICATION | | | |
| Credit | | X | |
| Ease of getting credit | | X | |
| Domestic credit to private sector, % GDP | | X | |
| Microfinance gross loans, % GDP X | | X | |
| Investment | | X | |
| Ease of protecting minority investors | | X | |
| Market capitalization, % GDP X | | X | |
| Venture capital deals/bn PPP$ GDP | | X | |
| Trade, competition, and market scale | | X | |
| Applied tariff rate, weighted avg, % | | X | |
| Intensity of local competition | | X | |
| Domestic market scale, bn PPP$ | | X | |
| BUSINESS SOPHISTICATION | | | |
| Knowledge workers | X | | |
| Knowledge-intensive employment, % | X | | |
| Firms offering formal training, % | | X | |
| GERD performed by business, % GDP | | X | |
| GERD financed by business, % | | X | |
| Females employed w/advanced degrees, % | | X | |
| Innovation linkages | X | | |
| University/industry research collaboration | | X | |
| State of cluster development | | X | |
| GERD financed by abroad, % GDP | | X | |
| JV-strategic alliance deals/bn PPP$ GDP | | X | |
| Patent families 2+ offices/bn PPP$ GDP | | X | |
| Knowledge absorption | X | | |
| Intellectual property payments, % total trade | | X | |
| High-tech imports, % total trade | X | | |
| ICT services imports, % total trade | X | | |
| FDI net inflows, % GDP | | X | |
| Research talent, % in business enterprise | X | | |
| KNOWLEDGE & TECHNOLOGY OUTPUTS | | | |

| | | | |
|---|---|---|---|
| Knowledge creation | | X | |
| Patents by origin/bn PPP$ GDP | | X | |
| PCT patents by origin/bn PPP$ GDP | | X | |
| Utility models by origin/bn PPP$ GDP | | X | |
| Scientific & technical articles/bn PPP$ GDP | | X | |
| Citable documents H-index | | X | |
| Knowledge impact | | X | |
| Growth rate of PPP$ GDP/worker, % | | X | |
| New businesses/th pop 15-64 | | X | |
| Computer software spending, % GDP | | X | |
| ISO 9001 quality certificates/bn PPP$ GDP | | X | |
| High- and medium-high-tech manufacturing, % | | X | |
| Knowledge diffusion X X | | X | |
| Intellectual property receipts, % total trade | | X | |
| High-tech net exports, % total trade | | X | |
| ICT services exports, % total trade | | X | |
| FDI net outflows, % GDP | | X | |
| CREATIVE OUTPUTS | | | |
| Intangible assets | X | | |
| Trademarks by origin/bn PPP$ GDP | | X | |
| Global brand value, top 5,000, % GDP | | X | |
| Industrial designs by origin/bn PPP$ GDP | | X | |
| ICTs & organizational model creation | X | | |
| Creative goods and services | X | | |
| Cultural & creative services exports, % total trade | X | | |
| National feature films/mn pop 15-69 | X | | |
| Entertainment & Media market/th pop 15-69 | X | | |
| Printing and other media, % manufacturing | X | | |
| Creative goods exports, % total trade | X | | |
| Online creativity | X | | |
| Generic top-level domains (TLDs)/th pop 15-69 | | X | |
| Country-code TLDs/th pop 15-69 | | X | |
| Wikipedia edits/mn pop 15-69 | | X | |
| Mobile app creation/bn PPP$ GDP | | X | |

| **Strengths** | **Weaknesses** |
|---|---|
| *Strong education system*<br>*Desire to create and innovate*<br>*Potential to develop more R&D*<br>*Multi-cultural and multi-language*<br>*Competitive in terms of salaries for international outsourced projects* | Poor infrastructure<br>Government absence<br>Business law that are unfavorable<br>Poor collaboration between industry and academia<br>Low purchasing power |
| ***Opportunities*** | **Threats** |

| | |
|---|---|
| *Create import substitution thus developing the industrial and production base*<br>*International cooperation*<br>*Leveraging a highly educated workforce with competitive cost* | *Further deterioration of the political, economic and financial situation*<br>*Security threats and instability*<br>*Brain drain increasing* |

# 6. Partner PP4: Confederation of Egyptian European Business Associations – CEEBA - Egypt - Al Iskandanyah

## *Brief description of the national innovation ecosystem*

Egypt came in as Africa's top investment destination for the fourth year in a row, according to Rand Merchant Bank RMB's Where to invest in Africa 2021 Report. While in the past 10 years, Egypt has succeeded in becoming a regional leader for promoting start-ups and innovation. The country has been ranked as the fastest growing start-up ecosystem in the Middle East and the second largest after the UAE. In the year 2020, 25% of all venture capital investments were spent in Egypt.

The fast development of the Egyptian start-up scene is the result of the efforts of the Egyptian government in the past years focusing in its country development strategy (Egypt Vision 2030) on the development on an innovation and technology ecosystems, as laid down in the Science, Technology and Innovation Strategy of the Ministry of Higher Education and the Innovation Strategy of the Ministry of Industry & Trade. The government's efforts were complimented by programmes of private and donor institutions, academia and finance institutions that have stepped up offering support services and finance to the start - up scene. This institutional set-up combined with a young and relatively tech-savvy population are the backbone of Egypt's growing start-up scene.

In addition, on March 25, 2021, the Minister of International Cooperation in Egypt declared that the portfolio in innovation, digitalization, and entrepreneurship stands at $1 billion, through 34 projects. Below is a brief about the status quo in Egypt:

**Investment Opportunities:** back to 2015, a total of US$8.6 million was invested in the Egyptian startups, while in 2021 this number reached US$ 403,562,000 million raised by 82 startups which is 158% increase compared by 2020. In 2021, we have witnessed impressive investment rounds like Halan which raised US$ 120 million, Capiter with an investment round of US$ 33 million, and trella successfully raised US$ 42 million. These numbers give a huge insight on how the startup scene and innovation ecosystem is booming in Egypt within the different sectors.

**Hubs-& co-working spaces:** innovation hubs and co-working spaces are a great physical space where innovators, researchers, subject matter experts, and students can work, meet, discuss potential collaborations, and explore opportunities. Egypt have around 200 hubs and co-working spaces all over Egypt. Some of them are private like the leading Co-working space MQR in Cairo, some of them

are inside public universities like I-Hub, and some of them are focusing to cover Upper Egypt like Cloud co-working space.

Despite this obvious success of establishing an extensive support ecosystem for start-ups in Egypt, many SMEs and start-ups still have challenges developing innovative products and services and they lack managerial skills to overcome the establishment phase of the first 1-2 years

***Brief description of the regional innovation ecosystem***

Entrepreneurship, innovation and investment ecosystems are made up of a wide range of stakeholders (start-ups, business angels, public-private funds and programmes, universities, centres of technological excellence, incubators/accelerators, venture builders, technology parks, innovation centres and laboratories, and demonstration centres, clusters, public administrations, etc.), which are all interrelated and whose number, quality and interlinkages determine their growth and potential for boosting employment, development and shared wealth.

Generally speaking, the main obstacles the innovation system has faced in the Mediterranean since before the outbreak of the pandemic are difficulties in finding adequate financing to meet entrepreneurs' needs, excessive bureaucracy and administrative procedures, a lack of skilled workers and fear of failure. While access to finance for innovation is a global problem that has worsened following the pandemic, meeting the financial needs of a business project is a major challenge in the Mediterranean area, given the limited government support, the very limited venture capital industry and the difficulty in accessing global investors. In terms of knowledge and the development of human capital, employers in the region struggle to find staff with the necessary training and practical experience. Part of the problem is the underutilisation of the potential of women in the region. In fact, only 14% of Arab SMEs are owned by women, compared to one in three on average globally (IMF 2019). With regard to inclusion, entrepreneurship in the Mediterranean region should therefore consider aiming to encourage more women to get involved in innovation practices. One aspect of this issue is the lack of an innovation-friendly culture among many public authorities. With this in mind, many governments in the region have made spreading a culture of innovation and entrepreneurship part of their national innovation strategies. A further issue is the poor regulation of intellectual property rights, which prevents the results of research from being applied in the real world. It should also be stressed that political and economic instability in parts of the Mediterranean is a key factor hampering entrepreneurship, as is the underdevelopment of infrastructure, especially as regards energy supply and ICT infrastructure.

An example of how COVID-19 and digitalisation have influenced innovation ecosystems can be seen in the many small entrepreneurial ecosystems made up of just a few dozen public and private players from all fields of entrepreneurship. This pattern, which can be found right along the Mediterranean, has come about thanks to two fundamental facts: on the one hand, awareness of the economic emergency and, on the other hand, uptake of digitalisation.

Despite the progress made, many obstacles still persist and the governments still have a lot of work ahead of them to turn their countries' innovation ecosystems into truly prosperous systems. In this regard, public administrations have a vital role to play in speeding up administrative procedures, facilitating access to finance and developing policies on skilled training.

***Economic areas of regional importance***

With a total population of +100 million and due to many restrictions caused by the spread of COVID-19 pandemic, the government of Egypt is currently implementing the second phase of the economic reform program, which is based on a set of structural reforms that support the nation’s sustainable

economic growth, focusing on several priority sectors that include agro-business, Logistics, Health-tech, Ed-tech, green transportation, energy, health and wellness, sustainable travel, efficient food supply chains and the development of both urban and rural communities, and information technology;

***Examples for the mega projects/industries/fields that highly affect the economic areas of regional importance:***

**Energy**

Egypt is a major regional hub for electricity and plans to become a global hub for electricity with a focus on Renewable energy and green hydrogen.

Egypt is planning to increase the capacity of the electricity interconnection line with Libya to up to 450 megawatts (MW) short term. It has existing power interconnection with Libya, Jordan and Sudan and will also build an interconnection with Iraq (through Jordan). Egypt's Ministry of Electricity began implementing the first steps to turn Egypt into a global energy hub by launching in January 2020 the first phase of the electricity interconnection project with Sudan with an initial capacity of 70 MW, which would later be increased to 2,000 MW. The project will connect Egypt to Ethiopia, and subsequently to the rest of Africa. Egypt and Cyprus recently signed an MoU for connecting their electricity grids. According to Minister Shaker both countries plan to exchange up to 2 GW of electricity in the first stage. Cyprus Energy Minister Natasa Pilides was quoted saying that the cooperation will allow for further integration of renewables in the energy mix, enhancing the security of our energy supply and enabling both countries to become exporters of energy.

**Logistics**

Egypt' s strategic location between the continents makes its port having a major regional and global importance. The country has 41 ports with Alexandria and it adjacent dekliya port being the main ports channeling around 65% of the trade ' s port. Still the port has been performing below its potential, mainly due to space restrictions and a need for modernization. The new extension, the Tahya Masr Multipurpose Terminal will transform the Alexandria Port into a regional and global hub for trade and logistics.

Suez Canal Economic Zone (SCZONE): In line with Egypt Vision 2030, the General Authority for the SCZONE is sparing no effort to contribute to driving Egypt's economic growth by making the Suez Canal Economic Zone a global investment hub and a dynamic export platform - with access to Africa, the Middle East, and Europe.

Among other activities, a forceful strategy is being pursuit over the 2020-2025 period, to shed light on the investment opportunities in Egypt's various economic sectors - especially multi-modular freight, ICT, and Energy- while putting in place the ecosystem and regulatory framework required for delivering first-rate services.

In the Manufacturing Sector, the Suez Canal Economic Zone offers many opportunities in a broad range of industries, including Pharmaceuticals, Food Processing, Automotive, Textiles, and Consumer Electronics. In the Maritime Sector, SCZONE offers a variety of opportunities in the areas of ports, container terminals, and logistics centers as well as shipbuilding and ship repair.

**Agro-business**

Historically, Egyptians started establishing agriculture-based civilization thousands of years ago. Still, agriculture is the backbone of Egypt's economy. The sector employed nearly a quarter of Egypt's workforces in 2020, which has the highest economic sector share in employment. As the government of Egypt is currently promoting agriculture and land reclamation as one of the country's best sectors to invest in, it's important to provide an aerial view of the entire sector. To consolidate the strength of the agro-business sector, it is needed to implement digital transformation in the agriculture sector, enhance agricultural productivity, modernization of irrigation, reducing of waste in the value chain, raise the level of food security in strategic food commodities, by further developing national strategies and plans for food and nutrition security and finally boost the sustainable use of natural agricultural resources.

As stated by the Ministry of International cooperation, the digitization of the financial sector is a catalyst to the recovery strategy put in motion by the Government in Egypt, aiming to maintain the economic and social development. Egypt endeavor to be a regional pioneer in the entrepreneurial scene, by focusing on engaging the private sector and supporting startups and Small and Medium-sized Enterprises (SMEs), especially in the field of financial technology.

### *Production systems with greater innovative potential in the region*

Egypt is the Arab world's second-most attractive foreign direct investment FDI destination in 2020 according to the Arab Investment and Export Credit Guarantee Corporation's Investment Climate 2020 report. In line with Egypt, , Egypt is committed to implementing the country's long-term strategic plan to achieve the principles and goals of sustainable development in all areas and to mainstream them in the country's different state agencies. Clearly, combatting the negative impacts of climate change is one of the major pillars of Egypt's roadmap towards achieving comprehensive sustainable development at the economic, social, and environmental levels.

Therefore, the Ministry of Environment is cooperating on this vital issue with a variety of industries and sectors, including Energy, Logistics, Transportation, Urban Communities, Water, Agriculture, Health, and Tourism.

### *Example of efforts to turn different sectors into a conducive, investor-friendly one;*

The Suez Canal Economic Zone is offer many opportunities in the development of renewable and clean energy. Being the main logistics hubs in North Africa and the Middle East, SCZONE has a vision to develop a global center for maritime transport and logistic services, an industrial center, and a gateway for trade between East and West. The Suez Canal Economic Zone also aims to leverage the huge potential of the Suez Canal and the surrounding land for developing an efficient, competitive, and eco-friendly business environment that leads, at the end of the day, to creating jobs for Egyptians.

Egypt, spanning Africa and Asia, is situated on the Mediterranean, midway between East and West - which makes the country an ideal location for exporting agricultural products to almost all major consumer markets. The government of Egypt is sparing no effort to provide huge investment opportunities in the country's agriculture and land reclamation sector. With this, agriculture is poised to play a vital role as a major source of investment, both from the domestic market and overseas. Egypt's total agricultural crop production has increased by more than 20% over the past 10 years, with a high priority given to making the nation 75% self-sufficient in wheat within the next ten years. Egypt's agriculture sector expanded into new markets in the first quarter of 2020, with the country starting to sell dates to Australia, citrus fruits to Brazil,

oranges to New Zealand, and potatoes to Mauritius. Egypt was the number one global exporter of citrus fruits during the first quarter of 2020.

## *Brief description of Sectors/ thematic areas/ with sustainability spin*

Energy

Egypt is one of the leading renewable energy deployment countries in the region and it has an ambition to export renewable energy to the EU and neighboring countries. The Egyptian Ministry of Electricity is planning to produce 65% of its electricity by RE sources by 2050. In the frame of the rising international interest giving to green hydrogen recently as a major contributor to the energy transition, the production of green hydrogen replacing grey hydrogen for example to produce green ammonia, as well as for steel production and refining is high on agenda of the energy ministries. Adding green hydrogen to its energy output, will give the Renewable energy sector another major push for deployment. Future challenges will lie in developing cost-efficient technologies for the renewable energy and green hydrogen sector as well as for its infrastructure (transport etc).

Sustainable Transport

Modernizing and extending the country' s transport sector is a core priority of the government aiming to offer sustainable, reliable and affordable transport to all. The investments foreseen in the transport sector reflect this ambition: H.E. Dr. Hala El-Said, Minister of Planning and Economic Development recently announced that the planned investments for the transport sector for the 2021/22 amount to 244.7 BL. EGP, which constitutes a growth rate of 104% in comparison to the years before the COVID-19 pandemic. Reducing the growth of the energy consumption and the related greenhouse gas emissions from transport can only be accomplished by reshaping mobility through a modernization and extension of the public transport, switching to electric mobility, switching to low emission fuels such as natural gas, applications of smart transport and its integration with sustainable Mega cities initiatives, improve transportation infrastructure including rails and road etc. An integrated and low-emissions transport strategy includes also to tackle private mobility (cars) and busses. Egypt aims to convert 400,000 vehicles to operate on natural gas within three years and a country strategy for e-mobility is under preparation. The Egyptian Ministry for public enterprises is planning to produce 25 000 electric cars annually from 2022. The corresponding infrastructure such as charging stations is among the many future challenges for the e-mobility.

Water & Sustainable agriculture

Egypt is approaching the state of water poverty for its citizens. To secure fresh water, major investments in the exploitation of alternative drinking water sources and water use desalination plants, technologies for wastewater treatment and grey-water use. The water scarcity also has a major impact on the agricultural sector and innovative irrigation methods, international innovations and trends, Quality control and assurance for Contractors, Operation and Maintenance, Water management and the Internet of things (automation, sensor control). Renewable energy applications such as solar pumping for remote areas.

## *Brief description of Policies context (1-2 par) at EU, Country and regional level, priorities, OI, sustainability (Green Deal, etc.) Trade agreements for logistics, Green affects the food sector*

Trade agreements

Egypt is a signatory to several multilateral trade agreements covering a market of over 3.1 billion consumers:

- The African Continental Free Trade Area (AfCFTA)
- European Union-Egypt Free Trade Agreement (Association Agreement)
- Free Trade Agreement with EFTA States
- Turkey-Egypt Free Trade Agreement
- Greater Arab Free Trade Area Agreement
- Agadir Free Trade Agreement among Egypt, Morocco, Tunisia and Jordan
- Egyptian-European Mediterranean Partnership Agreement

- The Common Market for Eastern and Southern Africa (COMESA)
- Pan Arab Free Trade Area (PAFTA)
- Egypt-MERCOSUR Free Trade Agreement

Moreover, Egypt has signed several bilateral agreements with Arab Countries: Jordan (December 1999), Lebanon (March 1999), Libya (January 1991), Morocco (April 1999), Syria (December 1991), and Tunisia (March 1999). Additionally, in 1995, Egypt and China entered into a trade accord. Egypt has also signed an economic treaty with Russia.

In June 2001, Egypt signed an Association Agreement with the European Union (EU) which entered into force on June 1, 2004. The agreement provided for immediate duty-free access of Egyptian products into EU markets, while duty free access for EU products was phased in over a twelve-year period. In 2010, Egypt and the EU completed an agricultural annex to their FTA, liberalizing trade in over 90 percent of agricultural goods.

Investment promotion

The new Investment Law # 72 of the year 2017 provides investment incentives in the form of a substantial discount off the taxable net profits to certain projects, including the food, agricultural products, and agricultural waste recycling industries.

Egypt signed a free-trade agreement with the Mercosur, with Egyptian exports to the group of countries jumping by 115% since the agreement entered into force in 2017.

Given the huge changes Egypt is witnessing in the provision of telecommunications services and the transition into a digital society, the government of Egypt has given priority to developing the ICT sector, coping up with technological leaps and creating a new state-of-the-art ecosystem through issuing a number of laws that regulate this sector. MCIT is cooperating with the state's other sectors to reform the legislative environment, through proposing a number of laws. The cybercrime law, the intellectual property, consumer protection and e-signature laws have been enacted. In addition, Egypt has issued the Personal Data Protection Law, which is in line with international laws and the European Union's General Data Protection Regulation (GDPR), and the executive regulation implementing “the Anti-Cyber and Information Technology Crimes” Law.

## *SWOT Analysis of the innovation ecosystem of the Region*

| **Key innovation strengths and weaknesses of the Region** | **strengths** | **weaknesses** | **Notes** |
|---|---|---|---|
| | | | |
| **INNOVATION INPUTS INSTITUTIONS** | | | put X in the strengths or in the weaknesses column in every row; |

| | | | |
|---|---|---|---|
| | | | leave it blank if it is the case |
| | | | |
| Political environment | X | | |
| Political and operational stability | X | | |
| Government effectiveness | | X | |
| Regulatory environment | | X | |
| Regulatory quality | | X | |
| Rule of law | X | x | |
| Cost of redundancy dismissal, salary weeks | | X | |
| Business environment | X | | |
| Ease of starting a business | X | | |
| Ease of resolving insolvency | | X | |
| | | | |
| **HUMAN CAPITAL & RESEARCH** | | | |
| Education | | X | |
| Expenditure on education, % GDP | | X | |
| Government funding/pupil, secondary, % GDP/cap | | X | |
| School life expectancy, years | | X | |
| PISA scales in reading, maths, & science | | | |
| Pupil-teacher ratio, secondary | | | |
| Tertiary education | | | |
| Tertiary enrolment, % gross | | | |
| Graduates in science & engineering, % | X | | |
| Tertiary inbound mobility, % | | | |
| Research & development (R&D) | | X | |
| Researchers, FTE/mn pop | | X | |
| Gross expenditure on R&D, % GDP | | X | |
| Global R&D companies, avg exp top 3, mn $US | | | |
| QS university ranking, average score top 3* | | | |
| | | | |
| | | | |
| **INFRASTRUCTURE** | | | |
| Information & communication technologies (ICTs) | | X | |
| ICT access* | X | | |
| ICT use* | | X | |
| Government's online service* | X | | |
| E-participation* | | X | |
| General infrastructure | | X | |
| Electricity output, kWh/mn pop | X | | |

| | | | |
|---|---|---|---|
| Logistics performance* | | X | |
| Gross capital formation, % GDP | | | |
| Ecological sustainability | | X | |
| GDP/unit of energy use | | | |
| Environmental performance* | | | |
| ISO 14001 environmental certificates/bn PPP$ GDP | | | |
| | | | |
| MARKET SOPHISTICATION | | | |
| Credit | X | | |
| Ease of getting credit | X | | |
| Domestic credit to private sector, % GDP | | | |
| Microfinance gross loans, % GDP X | X | | |
| Investment | X | | |
| Ease of protecting minority investors | | X | |
| Market capitalization, % GDP X | | | |
| Venture capital deals/bn PPP$ GDP | | | |
| Trade, competition, and market scale | | X | |
| Applied tariff rate, weighted avg, % | | X | |
| Intensity of local competition | | X | |
| Domestic market scale, bn PPP$ | | | |
| **BUSINESS SOPHISTICATION** | | | |
| Knowledge workers | | X | |
| Knowledge-intensive employment, % | | X | |
| Firms offering formal training, % | | X | |
| GERD performed by business, % GDP | | | |
| GERD financed by business, % | | | |
| Females employed w/advanced degrees, % | | X | |
| Innovation linkages | | X | |
| University/industry research collaboration | | | |
| State of cluster development | | | |
| GERD financed by abroad, % GDP | | | |
| JV-strategic alliance deals/bn PPP$ GDP | | | |
| Patent families 2+ offices/bn PPP$ GDP | | | |
| Knowledge absorption | | X | |
| Intellectual property payments, % total trade | | X | |
| High-tech imports, % total trade | | | |
| ICT services imports, % total trade | | | |
| FDI net inflows, % GDP | | | |
| Research talent, % in business enterprise | | | |
| **KNOWLEDGE & TECHNOLOGY OUTPUTS** | | | |
| Knowledge creation | X | | |

| | | | |
|---|---|---|---|
| Patents by origin/bn PPP$ GDP | | | |
| PCT patents by origin/bn PPP$ GDP | | | |
| Utility models by origin/bn PPP$ GDP | | | |
| Scientific & technical articles/bn PPP$ GDP | | | |
| Citable documents H-index | | | |
| Knowledge impact | | | |
| Growth rate of PPP$ GDP/worker, % | | | |
| New businesses/th pop 15-64 | | | |
| Computer software spending, % GDP | | | |
| ISO 9001 quality certificates/bn PPP$ GDP | | | |
| High- and medium-high-tech manufacturing, % | | | |
| Knowledge diffusion X X | | | |
| Intellectual property receipts, % total trade | | | |
| High-tech net exports, % total trade | | | |
| ICT services exports, % total trade | | | |
| FDI net outflows, % GDP | | | |
| **CREATIVE OUTPUTS** | | | |
| Intangible assets | | | |
| Trademarks by origin/bn PPP$ GDP | | | |
| Global brand value, top 5,000, % GDP | | | |
| Industrial designs by origin/bn PPP$ GDP | | | |
| ICTs & organizational model creation | | | |
| Creative goods and services | | | |
| Cultural & creative services exports, % total trade | | X | |
| National feature films/mn pop 15-69 | X | | |
| Entertainment & Media market/th pop 15-69 | | | |
| Printing and other media, % manufacturing | | | |
| Creative goods exports, % total trade | | | |
| Online creativity | | | |
| Generic top-level domains (TLDs)/th pop 15-69 | | | |
| Country-code TLDs/th pop 15-69 | | | |
| Wikipedia edits/mn pop 15-69 | | | |
| Mobile app creation/bn PPP$ GDP | | | |

| **Strenghts** | **Weaknesses** |
|---|---|
| *eg quality of University and Research Centre*<br>*High number of research centers,* | eg *Low level innovation in SMEs,*<br>*Moderate Innovator, Innovation performance* |

| | |
|---|---|
| *universities and knowledge transfer capacity*<br><br>*Excellent infrastructure for business development and attraction of external investment*<br>*The investment in R&D is higher than in the next regions*<br>*High presence of large multinational companies*<br>*High number of highly skilled professionals in Engineering and Science*<br>*High market needs*<br>*Creative youth*<br>*Mega projects in multiple sectors as; TVET, Agro, Logistics, …etc.* | *has declined in last years (-11%)*<br>*Lack of collaboration between IDEs*<br>*Lack of effective connection between industry and research due to bureaucratic, organizational and cultural problems that impede an effective cooperation between companies and the public system of R&Ds.*<br>*Weak public and private financial support for R&D (exception is TICs) the need for more flexible, agile and resilient businesses capable of coming up with sound responses to changing environments*<br><br>*No clear management bodies to create OI ECOSYSTEM (Fragmented)* |
| ***Opportunities*** | **Threats** |
| *eg international co-operation*<br>*Increasing interest in fostering R&D associations and collaboration*<br>*Attraction of high level, highly educated and prepared human capital*<br>*Increase in the exploitation of available R&D results and IP.*<br>*Internationalization of local SMEs.*<br><br>*identifying developmental gaps at the level of governorates: The Egyptian government, in partnership with the UN Population Fund (UNFPA), has made enormous efforts to produce, for the first time, 27 reports for the localization of SDGs for each of the governorates. The reports aim to provide an overview of the progress of some SDGs indicators in the various governorates and compare them with the 2030 targets* | **eg** *economic crisis caused by Covid19*<br>*Low public R&D expenditure as a consequence of budgetary restrictions*<br>*Risk of decreased interest from investors due to higher potential development of other regions*<br>*Low number of innovative companies in high tech industries*<br>*Difficulty to retain talent. Drain of young professionals and entrepreneurs*<br>*Difficulty of innovative companies to access new markets and retain markets shares due to their small size*<br><br>*Copy rights and Intellectual property rights*<br>*Unclear goals*<br>*Wrong audiences*<br>*Finding the right tools* |

## 7. Partner PP5: Science and Technology Park of Sicily – STPS - Sicily – Italy

**Capital:** Palermo
**Size:** 25,711.4 km$^2$
**Population:** 5,048,509
**Regional GDP:** 84,830
**% of the National GDP:** 5.46

**% of Unemployment:** 17,9

## *Brief description of the national innovation ecosystem*

The 2019 Eco-Innovation Index ranks Italy 8th, after northern countries like Sweden, Germany, Finland, Netherland but the economic crisis and Covid19 impact has changed current situation, especially in Southern Italy. According to the last EU "Regional innovation Scoreboard", all Southern Italy regions, Sicily included, are "moderator Innovator instead of "strong Innovator of Northern area. The evident gap suggest the necessity to strengthen company managerial skills, encourage business networking and clustering, offering business matching opportunities in order to increase competitiveness and enhance their ability to consolidate open innovation approach in the international market.
In order to overcome the national digitalization and sustainability limit a huge investment plan has been established, National Recovery and Resilience Plan, 191.5 billion of Euro; which will be invest in Digitalization, Sustainability and Energetic .
Sicily is the largest island in the Mediterranean sea and the widest region in Italy. It lags behind the national economy in terms of GDP per capita and unemployment rate. The main regional data are as follows (Source Istat 2021):
Population 5,048,509; Unemployment rate 17,9 %; Active enterprise 375.376; GDP on total national 5.46%. Added value, the contribution is mainly due to Service sector (about 78%), followed by industry (13%). The main sectors are Construction (4,8%) and Agriculture (3,7%). At national level Services 74%, Industry 19,6% and Agriculture 2,1 %. The most dynamic sectors belong to Chemistry, Mechanics, ICT & Electronics, Pharmaceutical & Health, scientific and technical activities, concentrated in the largest cities where are located the Universities: Palermo, Catania and Messina. In the Region are also present the major national public research centres such as CNR (National Council of Research), ENEA ( Energy and Sustainable Development) and CREA (Research in Agriculture) and 3 main large industries STMicrolectronics, Enel and Green Powe (Energy Sustainability).
The Smart Specialization Strategy (S3 by European Union) is managed by Regione Siciliana the main regional body that implement the innovation policy and coordinate the stakeholders of the innovation ecosystem. The policies has been focused in the areas of Life Science, Energy, Smart Cities, Tourism & Cultural Heritage, Sea Economy, Agri-Food.
In the next EU period (2021-2027) the regional investment will be focused on the following priorities: 1) Smarter Europe; 2) a Greener Carbon Free Europe investing in energy, renewables and against climate change; 3) a more Connected Europe, with strategic transport and digital networks 4) a more Social Europe, supporting quality of employment, education, skills and equal access to healthcare; 5 ) a Europe closer to citizens, by supporting sustainable urban development.
***(More Details Annex 1)***

## *Brief description of the regional innovation ecosystem*

The regional innovation ecosystem includes entrepreneurs, researchers, university, investors, venture capital as well as business development and other technical service providers are very dynamic. It's based on many stakeholders (regional/national Clusters, Technology Districts, Productive Districts, Universities, Research Laboratories, Business and Innovation Centres, European Networks, Entrepreneurial Associations, Incubator, Ect. ) operating at regional/national/ international level with the ambition to implement the innovation and industrial strategy of the policy Makers (European Union, National Government, Sicily Region) through utilizing the financial resources allocated. The high-tech companies are mainly based in the provinces of Catania, stronger specialization on manufacturing (equipment telecommunication, software) and Palermo (Innovative services and ICT). Some strategic cluster on Mechatronics, Micro and Nano-System, Nautical,

Agro-biotech & Sea, Biomedical has been created; and recently Industry 4.0 Competence Centre on Advanced Robotics and Enabling Digital. Technologies & System.
The model relies on strong ties with Universities, Research Centre and Services providers in order to promote productive chain built on lines of relationship and intellectual specialization, innovation and industrialization. The district proposal has been focused on strengthening of a cooperation network which can develop over time the sharing of knowledge and skills to provide competitive advantage to the participating companies. Last but not least it has been launched, by Invitalia (National Agency for Inward Investment and economic development), the scale-up program, dedicated to business development innovative SMEs, innovative start-ups and university spin-offs.
They will be supported through training and tutoring initiatives and bring them closer to the capital markets and the world of OPEN INNOVATION.

## *Economic areas of regional importance*

Including sustainability aspects, considering that the concept of sustainability is composed of three pillars: **economic, environmental, and social**—also known informally as **profit, planet, and people**
A consolidated system of relationship with stakeholders from all the categories of the quadruple helix are present in Sicily supported by innovation and sustainable European, National and Regional and policy, namely: a) research community b) business environment c) governance level d) civil society. The main economic areas are as follows:
-Digitalization, Innovation, competitiveness, culture and tourism
-Green revolution and ecological transition
-Infrastructure from sustainability mobility
-Education and research
-Inclusion and cohesion
-Health.
A lot of investments are planned considering that The southern Italy are 40% of the fund planned (details https://italiadomani.gov.it/en/home.html )

Based on Open Innovation Approach Regional have importance in Sicily the following organization:
**1)** In the fields of renewable resources and energy **Innovation Hub of Enel Green Power** established to driver for growth in Sicily and accelerate the energy transition. Seeking Open innovative solution to produce clean energy efficiently and sustainably, Disruptive technologies, safer, more effective process, constantly updated skills.
**2) Free Mind Foundry**, International **Cooperation** Hub, Mediterranean Smart Digital Campus focusing on the critical infrastructures of energy, Telco, transportation and healthcare.
**3) Consorzio Arca**, Academic Incubator **active** in all its strategic area: promotion of new entrepreneurship, technology transfer to SMEs, development of international networks.
**4) Consorzio Etna HighTech**, Companies network to offer ICT, digital and quality solution guaranteeing value creation to client.
**5) Sicily Science Park**, with a majority of the Sicilian region and connected with the 4 Universities, Research Centers and local companies support the ecosystem through the creation of networks at local and global level and encourage national and international partnership opportunities. Specifically, the research and Innovation both traditional and emerging sectors such as: Agribusiness, Environment, Cultural Heritage, Biotech, Diagnostic; energy, Information and Communication Technology, Innovative Materials.
**6) Sicilian Technology District of micro & Nano-System**, Entity that aggregates actors to amplify skills present in Sicily and develop mission in the strategic direction of **Sustainability**, from an environmental, social and economic point of view.

**7**) **Micro-Electronic Pole (CNR, STMicroelectronics)** "Beyond-Nan" which **include** New materials (e.g. Silicon carbide), Photovoltaic, in the fields of microelectronics, aerospace, energy.
**8)** Underwater Telescope of **National Institute for Nuclear Physics InfrastructureIDMAR** Project
**9) Laboratory for Therapeutic and Health**, **Transplant**.

## *Production systems with greater innovative potential in the region*

Including sustainability aspects, considering the **17** different UN Sustainable Development Goals (SDGs)
Following the Covid-19 outbreak a lot of measure has been launched to handle the health and economic crisis in Italy to support citizens and business during the phase of containment of and coexistence with the virus. The policy has been based on measure to overcome the crisis through the improvement of digitalization of the regional ecosystem and stimulate sustainability development. The transition to economic, environmental and social sustainability has become a major priority for the Europe and consequently for its the regions , the backbone structure to implement a policy based on a strong resilient economy, with particular attention to SMEs. Encourage and support SMEs to find solutions and use financial incentives to further take-up sustainable investments. In Sicily the **Goals: 4** (Quality Education), **Goals** 9 (Industry, Innovation and Infrastructure), **Goals** 11 (Sustainable Cities and Communities) and **Goals** 8 (Economic Growth) have particular priority in the next program UE 2021-2027.

## *Brief description of Sectors/ thematic areas/ with sustainability spin*

Sicily Region based the industrial innovation policy on the European Commission Smart Specialization Strategy (S3)by identification of strategic areas, strengths, potential of the economy and an entrepreneurial discovery process driven by wide stakeholder involvement. The S3 priorities are:
1) Technological for smart cities and Communities : Challenge. Developing technologies and solutions for **smart cities and communitie**s. Technology and methods for minimizing the environmental impact-E-government and e-governance Smart living and mobility.
2) Healthy living care services and products **(Life Science**) Challenge: New technologies and medical devices to improve patients care, diagnosis and treatment. New diagnostic method for chronic and complex diseases. New pharmaceutical formulation and products. Regeneration medicine. Diagnosis and biomedical devices. Drug discovery, delivery e quality by design Digital transformation for healthcare (e-health).
3) Technologies for **clean energy and energy saving** Challenge: Infrastructure, technologies and management fro clean energy production and energy saving system.
4) **ICTs and new technologies for tourism and cultural industries** Challenge cross-sector innovation area: ICT and new technologies for tourism industry and valorization of the cultural heritage. New technologies for the diagnosis, recovery, management and enhancement of cultural and environmental resources. Technologies and models for co-creation of new experiential and cognitive experiences. Digital platform and web services for tourism and cultural promotion.
5)**Providing healthy and safe food (agri-food)** Challenge Producing healthy and safe food products with minimized environmental impact and with enhanced ecosystem services, zero waste and adequate societal value. Functional foods and nutraceuticals, agri-food logistic, food quality and security, innovation and sustainability for the agri-food sector.
6) **Blue economy** Challenge: Cross-sector innovation area: new technology for the development of the blue economy. Fishery, aquaculture, port safety and security, technologies for marine monitoring, innovative design for shipbuilding

## *Brief description of Policies context (1-2 par) at EU, Country and regional level, priorities, OI, sustainability (Green Deal, etc.)*

The New policies context is **S4** refers to **Smart Specialization Strategies** which ex-ante aim at improving **Sustainability** and inclusiveness through an innovation-drive policy. This strategy connect stakeholders within European Green Deal and the new industrial policy for a sustainable Recovery to the new green a digital economy. An S4 approach focused on synergies between innovation, sustainability, infrastructure and skills. And connects investment with regulation and reforms.

## *SWOT Analysis of the innovation ecosystem of the Region*

| | Key innovation strengths and weaknesses of the region | strengths | weaknesses | Notes |
|---|---|---|---|---|
| | | | | |
| | **INNOVATION INPUTS INSTITUTIONS** | | | put X in the strengths or in the weaknesses column in every row; leave it blank if it is the case |
| | | | | |
| | Political environment | | X | |
| | Political and operational stability | | X | |
| | Government effectiveness | | X | |
| | Regulatory environment | | X | |
| | Regulatory quality | | | |
| | Rule of law | | | |
| | Cost of redundancy dismissal, salary weeks | | | |
| | Business environment | X | | |
| **HUMAN CAPITAL & RESEARCH** | | | | |
| Education | | X | | |
| Expenditure on education, % GDP | | X | | |
| Government funding/pupil, secondary, % GDP/cap | | X | | |
| School life expectancy, years | | | X | |
| PISA scales in reading, maths, & science | | | X | |
| Pupil-teacher ratio, secondary | | | X | |
| Tertiary education | | | X | |
| Tertiary enrolment, % gross | | | X | |
| Graduates in science & engineering, % | | X | | |
| Tertiary inbound mobility, % | | X | | |
| Research & development (R&D) | | X | | |
| Researchers, FTE/mn pop | | X | | |
| Gross expenditure on R&D, % GDP | | | X | |

| | | | |
|---|---|---|---|
| Global R&D companies, avg exp top 3, mn $US | | X | |
| QS university ranking, average score top 3* | X | | |
| | | | |
| | | | |
| INFRASTRUCTURE | | | |
| Information & communication technologies (ICTs) | X | | |
| ICT access* | X | | |
| ICT use* | X | | |
| Government's online service* | | X | |
| E-participation* | | X | |
| General infrastructure | X | | |
| Electricity output, kWh/mn pop | X | | |
| Logistics performance* | X | | |
| Gross capital formation, % GDP | | X | |
| Ecological sustainability | X | | |
| GDP/unit of energy use | | X | |
| Environmental performance* | | X | |
| ISO 14001 environmental certificates/bn PPP$ GDP | | | |
| | | | |
| **MARKET SOPHISTICATION** | | | |
| Credit | | X | |
| Ease of getting credit | | X | |
| Domestic credit to private sector, % GDP | X | | |
| Microfinance gross loans, % GDP X | X | | |
| Investment | X | | |
| Ease of protecting minority investors | X | | |
| Market capitalization, % GDP X | | X | |
| Venture capital deals/bn PPP$ GDP | | X | |
| Trade, competition, and market scale | X | | |
| Applied tariff rate, weighted avg, % | X | | |
| Intensity of local competition | | X | |
| Domestic market scale, bn PPP$ | | X | |
| **BUSINESS SOPHISTICATION** | | | |
| Knowledge workers | X | | |
| Knowledge-intensive employment, % | X | | |
| Firms offering formal training, % | X | | |
| GERD performed by business, % GDP | | X | |
| GERD financed by business, % | X | | |
| Females employed w/advanced degrees, % | | X | |
| Innovation linkages | X | | |
| University/industry research collaboration | X | | |
| State of cluster development | X | | |
| GERD financed by abroad, % GDP | | X | |

| | | | |
|---|---|---|---|
| JV-strategic alliance deals/bn PPP$ GDP | | X | |

| Strenghts | Weaknesses |
|---|---|
| • *Quality of University and Research Centre High number of research centers, universities and knowledge transfer capacity*<br>• *Excellent infrastructure for business development and attraction of external investment*<br>• *The investment in R&D is higher than in the next regions*<br>• *High presence of large multinational companies*<br>• *High number of highly skilled professionalism Engineering and Science* | • *Low level innovation in SMEs, Moderate Innovator, Innovation performance has declined in last years (-11%)*<br>• *Lack of collaboration between IDEs*<br>• *Lack of effective connection between industry and research due to bureaucratic, organizational and cultural problems that impede an effective cooperation between companies and the public system of R&Ds.*<br>• *Weak public and private financial support for R&D (exception is TICs)* |
| ***Opportunities*** | **Threats** |
| • *International co-operation*<br>• *Increasing interest in fostering R&D associations and collaboration*<br>• *Attraction of high level, highly educated and prepared human capital*<br>• *Increase in the exploitation of available R&D results and IP.*<br>• *Internationalization of local SMEs.* | • *Economic crisis caused by Covid19*<br>• *Low public R&D expenditure as a consequence of budgetary restrictions*<br>• *Risk of decreased interest from investors due to higher potential development of other regions*<br>• *Low number of innovative companies in high tech industries*<br>• *Difficulty to retain talent. Drain of young professionals and entrepreneurs*<br>• *Difficulty of innovative companies to access new markets and retain markets shares due to their small size* |

# EMPHASIS

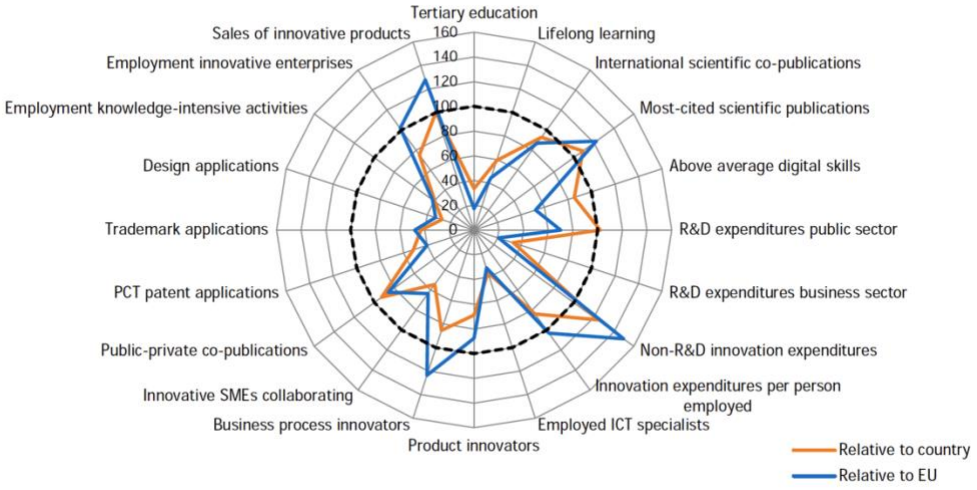
## Sicilia (ITG1)

| | Data | Normalised score | Relative to IT | Relative to EU |
|---|---|---|---|---|
| Tertiary education | 19.4 | 0.099 | 33 | 17 |
| Lifelong learning | 4.8 | 0.179 | 59 | 44 |
| International scientific co-publications | 904 | 0.487 | 93 | 87 |
| Most-cited scientific publications | 11.8 | 0.665 | 109 | 122 |
| Above average digital skills | 19.9 | 0.275 | 85 | 52 |
| R&D expenditures public sector | 0.51 | 0.339 | 102 | 70 |
| R&D expenditures business sector | 0.30 | 0.108 | 33 | 21 |
| Non-R&D innovation expenditures | ± | 0.643 | ± | ± |
| Innovation expenditures per person employed | ± | 0.605 | ± | ± |
| Employed ICT specialists | 1.5 | 0.161 | 36 | 32 |
| Product innovators | ± | 0.537 | ± | ± |
| Business process innovators | ± | 0.790 | ± | ± |
| Innovative SMEs collaborating | ± | 0.332 | ± | ± |
| Public-private co-publications | 142.8 | 0.424 | 93 | 86 |
| PCT patent applications | 0.55 | 0.249 | 52 | 40 |
| Trademark applications | 3.00 | 0.219 | 43 | 48 |
| Design applications | 0.43 | 0.188 | 27 | 33 |
| Employment knowledge-intensive activities | 8.6 | 0.248 | 39 | 42 |
| Employment innovative enterprises | ± | 0.610 | ± | ± |
| Sales of innovative products | ± | 0.808 | ± | ± |
| Air emissions by fine particulates | 11.8 | 0.586 | 145 | 119 |
| Average score | -- | 0.407 | -- | -- |
| Country EIS-RIS correction factor | -- | 0.927 | -- | -- |
| Regional Innovation Index 2021 | -- | 0.378 | -- | -- |
| RII 2021 (same year) | -- | -- | 74.4 | 70.3 |
| RII 2021 (cf. to EU 2014) | -- | -- | -- | 80.7 |
| Regional Innovation Index 2014 | -- | 0.275 | -- | -- |
| RII 2014 (same year) | -- | -- | 72.6 | 58.7 |
| RII - change between 2014 and 2021 | -- | 21.9 | -- | -- |

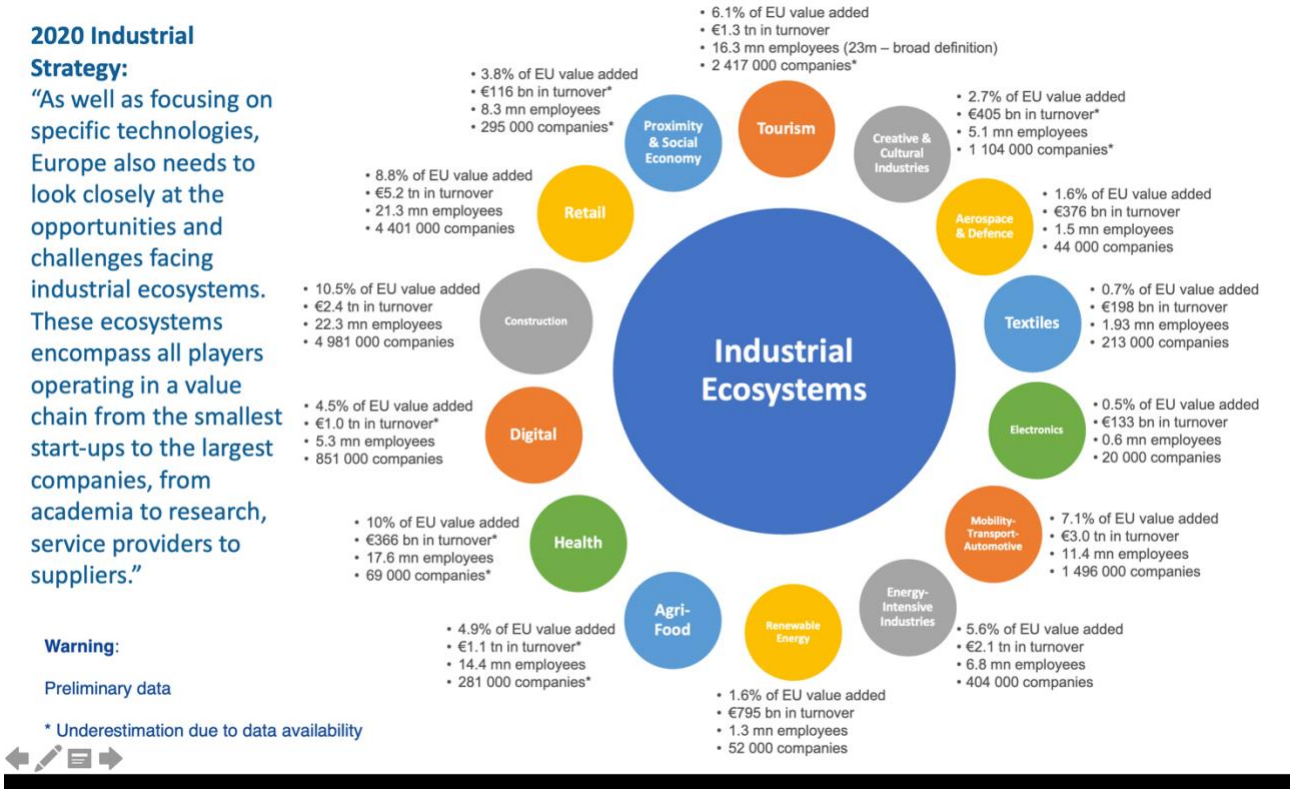
± Relative-to-EU scores are not shown as these would allow recalculating confidential regional CIS data.

Sicilia (ITG1) is a Moderate Innovator -. Innovation performance has increased over time (21.9%).
The table on the left shows the normalised scores per indicator and relative results compared to Italy and the EU. The table also shows the Regional Innovation Index (RII) in 2021 compared to that of Italy and the EU in 2021, the RII in 2021 compared to that of the EU in 2014, and performance change over time between 2014 and 2021.
The radar graph shows relative strengths compared to Italy (orange line) and the EU (blue line), showing relative strengths (e.g. Non-R&D innovation expenditures) and weaknesses (e.g. Tertiary education).
The table below shows data highlighting possible structural differences, e.g. Employment in Agriculture & Mining (above average) and Employment in Manufacturing (below average).

| | ITG1 | IT | EU |
|---|---|---|---|
| Share of employment in: | | | |
| Agriculture & Mining (A-B) | 8.8 | 4.0 | 4.6 |
| Manufacturing (C) | 7.5 | 18.6 | 16.4 |
| Utilities & Construction (D-F) | 7.9 | 7.5 | 8.2 |
| Services (G-N) | 66.2 | 64.6 | 62.9 |
| Public administration (O-U) | 9.6 | 5.4 | 7.1 |
| Average number of employed persons per enterprise | 2.7 | 3.8 | 5.2 |
| GDP per capita (PPS) | 18,000 | 29,800 | 31,200 |
| GDP per capita growth (PPS) | 2.20 | 2.98 | 3.21 |
| Population density | 192 | 202 | 109 |
| Urbanisation | 85.6 | 81.8 | 75.3 |
| Population size (000s) | 4,880 | 59,640 | 446,450 |



***EUROPE***




# 8. References

***Sustainability links :***

- Regional Innovation Scoreboard: https://ec.europa.eu/info/research-and-innovation/statistics/performance-indicators/regional-innovation-scoreboard_en
- Innovation driven Growth in regions https://www.oecd.org/sti/inno/smart-specialisation.pdf
- 2030 Agenda for Sustainable Development https://sdgs.un.org/2030agenda
- https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf

- Report of the World Commission on Environment and Development: Our Common Future https://policy.ellenmacarthurfoundation.org/universal-policy-goals
- https://international-partnering-environment-2020.b2match.io/home

***Open Innovation link:***

- Netherland https://e.kvk.nl/2/4/100/165/z-6BmYC1Zde6KkhmGAa6lPA2iBByE6HIeXh23qYo8eCzGnTHuyjJ45EEil4JFWQe?utm_source=kvk_business_challenge&utm_medium=email&utm_campaign=20210920_update_kvk_business_challenge
- Enterprise Europe Network matchmaking Platform: https://matcher-green-deal-edition-2021.b2match.io/page-1601
- Open Call European Programme
  https://digicirc.eu/blue-economy/
  https://digicirc.eu/bioeconomy/

# 9. Conclusions

Based on the analysis of the Project Partners' National/Regional Reports, the key common sectors identified are the following:

- Agrifood
- Sustainable Energy
- Environment & Sustainable Development
- Transport & Logistics
- Culture – Tourism – Cultural & Creative Industries

The main topics identified from the Project Partners' reports and according to the EUROMED priorities of the sectors of interest, the business challenges for creating strategic matches are as follows:

## Agrifood

- Improving the competitive position of agricultural crop product and livestock production in international markets
- Improving understanding of the relationship between nutrition, health and wellness, and the consequences for the agricultural food products and foodstuffs
- Sustainable Production
- Valorising food products from traditional Mediterranean diet
- Food Safety in local food chain
- Sustainable farming systems

## Sustainable Energy

- Energy efficiency
- Renewable energies
- Sustainable buildings and cities
- Smart electric grid
- Energy storage
- Energy for circular economy
- Energy for transport and mobility
- Hydrogen for climate neutrality
- Reducing the Environmental Footprint of Fossil Fuels
- Smart communities / cities with low energy consumption and almost zero emissions

## Environment & Sustainable Development

- Waste management
- Prevention, protection and restoration of air, soil, groundwater and marine environment
- Protection, promotion and sustainable management of biodiversity
- Mitigation and adaptation to climate change and response to natural and man-made disasters
- Water resources availability and quality within catchments and aquifers
- Sustainable, integrated water management
- Irrigation technologies and practices
- Use of alternative water resources

## Transport & Logistics

- Strengthening of the freight transport and supply chain system in order to increase the added value and the competitiveness
- Development of smart infrastructure and transport systems
- Sustainability in transports
- Strengthening of the intermodality and autonomy in urban transports of passengers and goods

## Culture – Tourism – Cultural & Creative Industries

- Strengthening of the innovation for developing new products and services for visitors of archaeological sites / museums / collections and other poles and cultural activity events
- Promotion and enhancement of digital entrepreneurship in the fields of Culture, Tourism and CCI

## ICT Information & Communication Technologies Culture – Tourism – Cultural & Creative Industries

- ICT approaches (AI, Data mining, etc.) to applied fields like agritech, fintech
- Outsourcing of ICT services in different subsectors ( banking ; insuretech ; fintech etc…)