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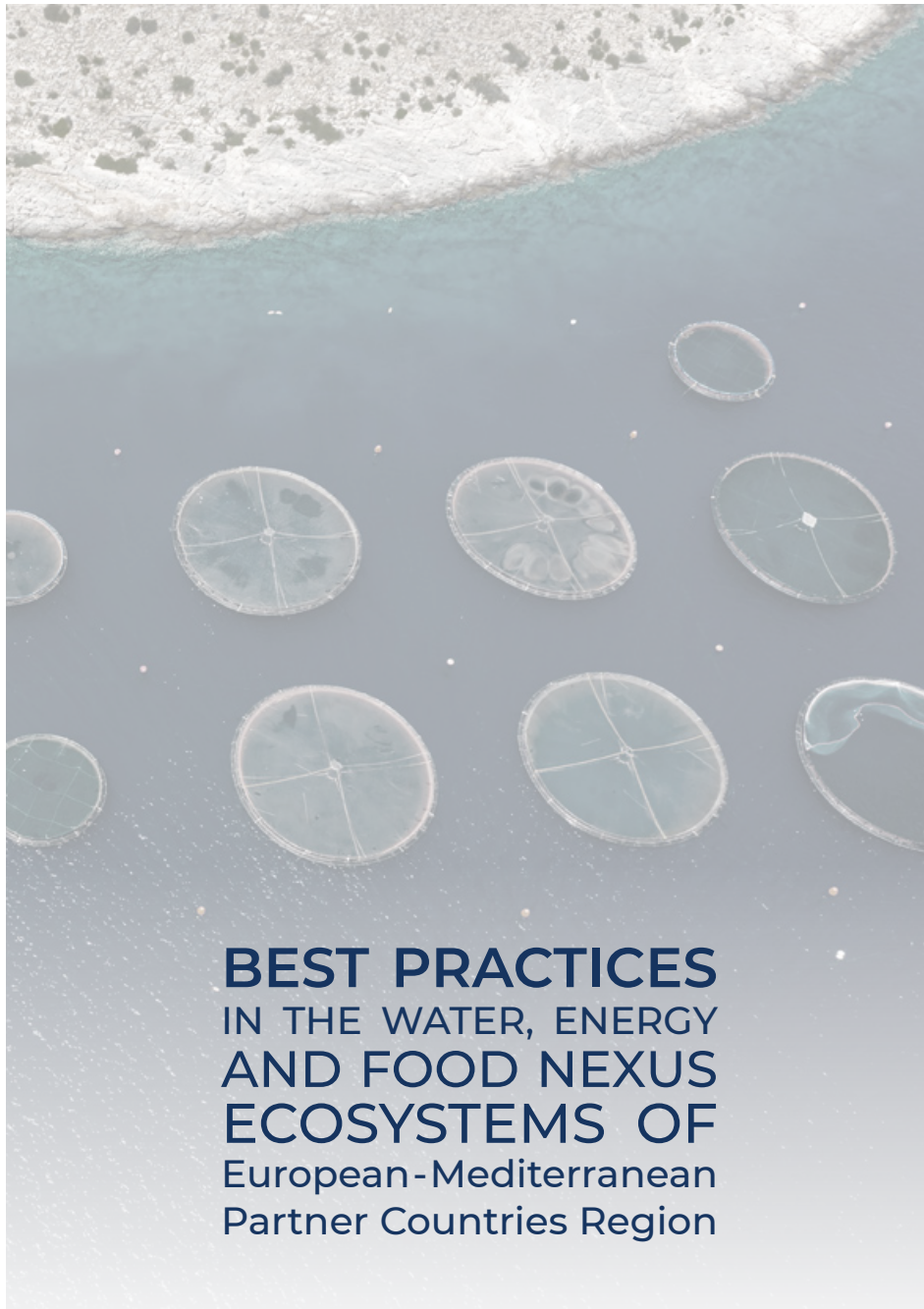


REGIONE AUTÒNOMA DE SARDIGNA
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NEX-LABS

BEST PRACTICES IN THE WATER, ENERGY AND FOOD NEXUS ECOSYSTEMS OF European-Mediterranean Partner Countries Region



BEST PRACTICES
IN THE WATER, ENERGY
AND FOOD NEXUS
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European-Mediterranean
Partner Countries Region



About NEX-LABS

NEX-LABS project includes a partnership of 11 institutions (Autonomous University of Barcelona (Spain), Chamber of Commerce and Industry of the Center Tunisia), Royal Scientific Society-Aqaba Liaison Center (JO), Berytech Foundation (LB), INNOLABS SRL (IT), Academy of Scientific Research and Technology (EG), American University of Beirut (LB), Centre for promotional services to enterprises – Special Agency of Cagliari Chamber of Commerce (IT), Net7 Srl (IT), C.I.P Citizens In Power (CY), The Jordanian Hashemite Fund for Human Development/Princess Basma Community Development Centre Aqaba (JO)) from 7 different countries across the Mediterranean. NEX-LABS project is funded by the European Union under the ENI CBC Med Programme. With a total budget of €3.450.984,97, the project has received a contribution of € 3.105.866,47 (90%).

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Introduction

This document summarises the key findings derived from the NEX-LABS project activities analysing a series of best practices in the current Water Energy and Food (WEF) ecosystem in the NEX-LABS project partnering countries. This list of best practices is an essential ingredient for building a catalogue for the NEXUS ecosystem in the European - Mediterranean Partner Countries (EU-MPC) region. In this document NEX-LABS partners define the best WEF ecosystem's practices which offers an adequate ground and starting point for developing different scenarios for implementing supporting strategies for NEXUS stakeholders' ecosystem. This activity will be complemented by a future report of NEXUS ecosystem' stakeholders, their segmentation, needs, challenges and priorities.

The summarised findings were derived from a qualitative analysis approach that has been deployed to define the best practice per each country. The results of the SWOT¹, SOR², PESTEL³ analysis conducted throughout previous activities were combined with the results of the NEXUS stakeholders mapping survey to represent a pool of raw material as inputs for qualitative analysis. The obtained data was coded per country, to identify specific practices, families, and then a general characteristic that become common per country based on the main perceived trends at the country.

The main observed findings show some commonalities and differences between countries regarding the status, focus, challenges, and competencies of the WEF ecosystem. **Entrepreneurial orientation, digitalization, and sustainable innovations** are common interests in every country. However, some countries are in a good phase with enough structural constituents of the ecosystem, like in Spain, Italy and Egypt, and now focusing on activating the current ecosystem components to move more entrepreneurial and agile towards addressing the WEF challenges. Other countries such as Cyprus, Tunisia, Lebanon, and Jordan are still in a reforming/transition phase of finding more ecosystem actors, issuing new legislation and policies or building national strategies for addressing WFE challenges.

The defined best practices in this document are not unified as each country; respectively, each ecosystem has its own features depending on the political and economic developing phase the country is going through. North African partners such as Egypt and Tunisia are handling the consequences of fulfilling the expectations of the Arab spring in 2011, which are a significant concern on the national level. European partners such as Spain and Italy have a well-established ecosystem structure; however, catching up with north European countries in terms of **digitalization economy, building sustainable innovation systems, increasing knowledge creation, and establishing networks between different ecosystem actors** are the main challenges and concerns of the current developing phase.

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1. SWOT analysis (or SWOT matrix) is a strategic planning and strategic management technique used to help a person or organization identify Strengths, Weaknesses, Opportunities, and Threats related to business competition or project planning.
 2. SOR Analysis is a hybrid of SWOT analysis, an application typically used to assess the business positioning of an organization. The SOR acronym means "strengths, opportunities, and roadblocks".
 3. A PESTEL analysis is a framework or tool used by marketers to analyze and monitor the macro-environmental (external marketing environment) factors: Political, Economic, Social, Technological, Environmental, and Legal





BEST PRACTICES



“Capitalizing
on the existing
infrastructure
toward a more
entrepreneurial,
agile and
collaborative
ecosystem for
a sustainable
economy”



SPAIN

OPEN INNOVATION

1. A plethora of support services to consolidate self-sustainable open innovation
2. Supporting the implementation of collaborative research and development (R&D) projects.
3. Supporting SMEs innovation capabilities by fostering knowledge transfer between companies, technology centres, universities, and other innovation agents.

COMPETITIVENESS

4. Foster innovation as one of the engines of competitiveness
5. Delivering tools to facilitate a competitive environment and social cohesion
6. Focusing on raising industrial competitiveness through supporting innovation, entrepreneurship and moving toward internationalization
7. Enlargement of regional Innovation Clusters and Hubs to increase regional competitiveness

SMES AND ENTREPRENEURS

8. Transferring knowledge to SMEs to lever their innovation capabilities and compensate the liability of smallness
9. Providing capital and financing schemes to facilitate SMEs growth and enhance their ability to compete globally.

DIGITAL AND SUSTAINABLE

10. Promoting Industry 4.0 and digitization between companies
11. Delivering training programs to improve workers' training to respond to the new needs of companies and society, as well as to technological change and production methods.
12. Providing high-quality infrastructure to attract investments and reduce energy cost
13. Adopting sustainability and circular economy strategies opting for a green and circular economy Reinforce internationalization

SUCCESSFUL EXAMPLES IN THE COUNTRY

In Spain, Innovation ecosystem efforts are now devoted to capitalizing on the existing infrastructure toward a more entrepreneurial, agile, and collaborative ecosystem for a sustainable economy. Notably, the role of municipalities is burgeoning as an active player in the ecosystem.

“There was political will, the most powerful industry factor, willing municipalities, universities, technology centres, the idea is to connect them to maximize performance and innovation,” Spain expert said during the interview with the NEX-LABS team

Municipalities in **Ripollet**, **Sabadell**, and **Cerdanyola del Vallès** use innovation hubs and living labs for engaging & activating citizens early in the changing process of building a circular economy. By doing so, municipalities let society feel that innovation programs and initiatives are theirs and ensure social cohesion and hedge against the risk of social rejection of such projects. Successful collaboration between different academia, industry and municipalities in Innovation Hubs motivates other municipalities to follow the same approach and enlarge current Hubs.

“Knowing what people are doing and joining efforts, with the resources available to move forward. Sometimes 1 + 1 is not two; it can be 4, 5, or 6. It is being noticed through different HuB that is generating a call effect to other municipalities who want to join the HuB and enlarge it,” - Spain expert declaration during an interview with the NEX-LABS team



“ Governmental
Reforming for
establishing the
essential infrastructure
toward a more
entrepreneurial,
innovative sustainable
economy with a
remarkable focus on
energy and building
legislations ”



CYPRUS

STRATEGIC ECONOMIC REFORMS

1. Launching the Economic Adjustment Programme in March 2016, the economy is now recovering, recording positive, broadly based growth since 2015.
2. The Government remains firmly committed to implementing structural and institutional reforms and policies to tackle the remaining challenges.
3. Smart Specialization Strategy's focuses on six priority sectors – 'Tourism, Energy, Agriculture –Food Industry Construction industry, Transportation, Health, and Environment'.

ENTREPRENEURIAL ORIENTATION

4. Focusing on the cultivation of an entrepreneurial culture
5. Enhancement of entrepreneurial innovation
6. Facilitating access to finance and markets for business innovation and young scientists and the startup community's
7. Enhancing human resources skills through redeploying education programs toward digital skills

BUSINESS ENVIRONMENT IMPROVEMENTS

8. Removing administrative burdens
9. Delivering better governmental services through adopting e-Government
10. Promoting the development of an innovation culture in the business sector.
11. Fostering collaboration between science and industry, effective knowledge transfer, and business innovation.

DIGITAL INFRASTRUCTURE AND SUSTAINABILITY

12. Industry digitalization through using cutting edge technologies
13. Awareness campaign concerning the development of digital culture by citizens and enterprises

14. Building smart factories and ensuring digital infrastructure through digital innovation hubs and technology transfer offices.
15. Ensuring sustainable development through using alternative energy systems
16. Develop Sustainability and circular economy strategies for a green and circular economy.

SUCCESSFUL EXAMPLES IN THE COUNTRY

Results of the PESTEL survey and interviews with Cyprus experts confirm that Cyprus has ploughed the ground for moving toward a circular economy by conducting many legal reforms. Reforms such as the Economic Adjustments program and Smart Specialization Strategy focus on building essential infrastructure for moving toward a more entrepreneurial, innovative sustainable economy with a remarkable focus on energy and building legislation. In this direction, separated strategies that target water, food, or energy started to be combined, forming a NEXUS strategy on the national level, driven by EU commission policies, and giving more space for the private sector to tackle such challenges.

“I am aware of such Public Private Partnership (PPP), and I think that some research programmes either through the EU or other funding schemes”, “... Cyprus is a big part of the European Union. A lot of EU legislations become national legislations. And these legislations look towards solving these challenges and trying to move towards stability and resilience of the water, the energy and the food sectors...” Cyprus expert told NEX-LABS team



“Recovering
after the
revolution in
2011 and moving
toward the
more active
role of the state
in achieving a
very potential
inclusive growth”



TUNISIA

ROLE OF THE STATE

1. Embarking more structural reforms for a more egalitarian and inclusive society and putting the country on a path to more sustainable development focusing on.
 - Quality of education, market regulations
 - Business climate, tax system
 - Public investment, good governance, and decentralization

ENTREPRENEURS AND STARTUPS

2. Presence of supporting programs for business incubators and startup
3. The company of TTOs allows the transfer of technologies
4. Existing banks dedicated to the financing of SMEs and startups, and microfinance institutions

HUMAN CAPITAL & KNOWLEDGE

5. Skilled & Well-trained Human Resources
6. High participation of women in the economic life
7. High-performance competitiveness Centers in specialized sectors
8. Research centres specialized in various activities (Water, Energy, Agriculture, horticulture...)

INFRASTRUCTURE

9. Enhanced rural transport infrastructure.
10. The wide presence of the government agencies and administrations at the deep rural areas.
11. Diversified financial sector well equipped to support innovative investments
12. A high renewable energy potential, especially solar energy

NGOS

13. Widely spread associative network
14. An active and dynamic network of associations

LEGAL ENVIRONMENT

15. Legal framework dedicated to Startups in Tunisia.
16. Evolving regulatory framework for investment and job creation
17. Development of Digital economic regulations
18. A dedicated law related to “Crowdfunding.”
19. A dedicated legal framework governing the PPP

SUCCESSFUL EXAMPLES IN THE COUNTRY

Tunisian entrepreneurial ecosystem became vibrant thanks to well-educated populations and dynamics around technological changes.

“There is a lot of buzz about technology. There is strong communication and awareness of technological change,” a Tunisian expert said in an interview with the NEX-LAB team.

There are also many effective innovation clusters, hubs, and active initiatives and programs.

“Clusters are an important boost to economic development if they are well managed. The experience of the mechatronics cluster has led to collaborative projects that have been commercialized internationally. They allow development partners and customers to save time and open the gate to the international market,” a Tunisian expert in an interview with the NEX-LAB team.



“Building agile ecosystem focusing on knowledge creation and ecosystem collaborations”



EGYPT

STRATEGIC ORIENTATION

1. Creating at least 3 million 'decent and productive' jobs between 2016 and 2020.
2. Increasing the annual industrial growth rate to 8%.
3. Research and innovation become a central component of the national strategies of Egypt 2030, aiming to place Egypt among the top 40 countries globally in terms of Research and Innovation (R&I).
4. Government and civil society focus on entrepreneurship and MSME success and competitiveness.
5. Entrepreneurs and Small and Medium Enterprises are recognized as the drivers of economic growth and employment
6. Political support in optimizing the local manufacturing and Egypt specialized industry like textiles, pharmaceuticals, and petrochemicals.

BUSINESS SUPPORTING PROGRAMS

7. Easy and fast digitalized procedures for company formation and operation, reducing time-to-start business for one day.
8. Supporting self-employed Egyptians through setting up different financial supporting programs.
9. With a surge of new Venture Capital (VC) funds, 16 new VC firms have developed an interest in startups, providing equity finance, as well as training and other types of support

SCIENTIFIC KNOWLEDGE CREATION

10. Establishment of new private research centres
11. Allocation of more than 1,000,000 euros annually for scientific missions abroad.
12. Reactivating a large number of qualified scholars in the diaspora.
13. High scientific productivity in the fields of Chemistry, Medicine, material sciences. The high impact of scientific fields like mathematics, physics, and agriculture.
14. Diversified mechanisms of public funding on R&D targeting WEF.

COLLABORATION AND NETWORKING

15. New schemes for public-private partnerships and technology alliances.
16. Emerging initiatives that support innovation in rural areas and link it to the centralized initiatives in main cities
17. New schemes for public-private partnerships and technology alliances.
18. Existence of technology transfer and IPR offices at the majority of Egyptian universities
19. Existence of many public initiatives to transform research results into economic value.
20. Numerous specialized research networks, including high energy physics, nanotechnology, nuclear research.

SUCCESSFUL EXAMPLES IN THE COUNTRY

Thanks to the accumulated endeavours of ecosystem actors. In 2017, the Egyptian Government issued a unified law defining Micro-Small-Medium Enterprises (MSMEs) across industrial sectors. This fundamental law was crucial for directing funding schemes and other innovation policy instruments. Egypt also has established the Micro-Small-Medium Enterprises Developing Agency (MSMEDA¹) to coordinate public innovation strategies and increase the harmony between ecosystem actors. For the first time, the Egyptian 2030 strategy included knowledge, innovation, and technology pillars to drive all ministries strategies and action plans toward a more innovation-based circular economy.

1. <http://www.msmeda.org.eg/>



“Active private sector and wide adoption of open innovation instruments”



INSTITUTIONAL STRUCTURE

1. Academic solid and Research institutions
2. Technical Expertise/know-how of Human Resources in the WFE sector
3. International donors' interest in the Lebanese green and environmental sector.
4. Entrepreneurship support institutions provide an enabling environment to develop startups around WFE challenges
5. Adequate geographical environment and climate conditions to develop and implement solutions in the WFE
6. Integration of social and environmental impact framework across projects to track social or environmental impact

OPEN INNOVATION FRAMEWORK

7. Open innovation process to support the development of solutions that address real market and industry challenges
8. Collaboration between academia and industries and co-creation of solutions
9. Engaging in regional networks and clusters
10. Availability of different programs supporting technology transfer and communication between various stakeholders
11. Existence of WFE targeted and specific networks of experts and mentors
12. Networking events and roundtables to foster the exchange of expertise and create collaboration and partnerships involving multiple stakeholders

SUCCESSFUL EXAMPLES IN THE COUNTRY

Only through interviews with Lebanon experts the concept of open innovation was mentioned as a fundamental approach for building a Water Energy and Food connected ecosystem. Open innovation as a mindset of ecosystem actors resulted in a variety of innovation networks, clusters, and knowledge exchange platforms working throughout the national innovation system.

“Stimulating
economic
growth through
the digitalizing
competitive
business
sector”



JORDAN

STRATEGIC ORIENTATION

1. Developing economic growth programs
2. Launching of many government-infrastructure projects focusing on agriculture, health, and transportation
3. Improving the business environment for the private sector
4. Reducing dependence on foreign resources
5. Investment renewable energy, transportation, smart use of electricity and desalination of seawater.
6. Investment in secure, dependable, and trustworthy infrastructure

DIGITALIZATION ECONOMY

7. Digitization of the economy and digital transformation
8. Integration of technologies in the most prominent economic sectors, especially agriculture, water, and energy

COOPERATION AND NETWORKING

9. Excellent cooperation with different sectors in Aqaba governorate (municipalities. department of agriculture, Aqaba Special Economic Zone. local farmers)
10. Existence of various business Incubators.
11. High interest from the Government to support the development of innovation incubators
12. Burgeoning Regional collaboration to support the sectors of energy, water, and food by private and governmental and public sectors

KNOWLEDGE AND SMES

13. The existence of distinguished experts to support Research and projects in the field of energy, water, and food
14. High potential in outreach work and Research implementation
15. The existence of support for small projects, with funding and in the form of grants

SUCCESSFUL EXAMPLES IN THE COUNTRY

Jordan's national strategy 2025 for handling the lack of water, food, and energy is now in place. Accordingly, a colossal water desalination project in Aqaba for agriculture and other projects for water purification for drinking.

"...Oh yes, water for agriculture is different from water to drink because we are suffering from the lack of drinking water, so the Water purification plants need large areas.." Jordanian expert told to the NEX-LABS interviewer

In addition, other investments packages were made in AlGoor-area- Jordan food basket- to supply enough food to the community in addition to other innovative solutions applied in Jordan

"There are also alternatives to some challenges such as water scarcity, such as hydroponics, which works to grow crops that require less water, as fodder crops were produced in this way, where fodder is grown with water to support the food sector of the animal sector. We have been working on this research for ten years," another expert told to the NEX-LABS interviewer



“ Using
established
infrastructure
toward a vibrant,
collaborative
ecosystem ”



ITALY

STRATEGIC ORIENTATION

1. Fostering innovation as an engine of competitiveness.
2. Improving regional competitiveness through clusters and Hubs of companies and institutions in the same sector
3. The National Industry 4.0 Innovation programme boosts the adoption of new technologies in the productive and industrial sectors

FUNDING R&D AND INNOVATION

4. Existence of platforms to support R&D and Innovation such as ENEATECH, AREA Science Park, and Fondo Nazionale Innovazione.
5. Projected establishment of a national funding system tailored to support innovation and R&D
6. A central role for the universities and the public research organizations

ENTREPRENEURIAL, COLLABORATIVE ECOSYSTEM

7. A vibrant startup ecosystem including startups focusing on food, agri-food, water, and energy.
8. Startups are often the result of spin-offs born from the collaboration among Universities and Technology Parks.
9. Emerging clusters of universities, research centres, and centres of excellence
10. Financing startups/SMEs or potential entrepreneurs with grants/loans by National institutions such as Invitalia
11. Nearly every region in Italy can count on Business Support Organizations (BSO).
12. Creation of Digital Innovation Hubs and Competence Centers promoted by EU Policies
13. Increasing collaboration among SMEs, Large Enterprises and Research Centers.
14. A growing significant number of international collaboration activities

SUCCESSFUL EXAMPLES IN THE COUNTRY

Although Water, Energy and Food (WEF) challenges are not yet directly targeted by legislation packages, many programs and initiatives could serve as a base for creating such a legislative environment.

“Specific calls, including ENI CBC Med and PRIMA, could help in building specific structural or legislative measures to address WEF challenges. In my opinion, COST action¹ could be potentially envisaged as a platform for international cooperation to address the structural and legislative WEF challenges,” an Italian expert told to the NEX-LABS interviewers

Considering that WEF challenges lay under the climate change pressures, Italy is targeted by laws on the EU levels such as Land-use, land-use change and forestry – LULUCF policies, the European Climate Law to enshrine the 2050 climate-neutrality objective into EU law, the 2030 Climate Target Plan to further reduce net greenhouse gas emissions by at least 55% by 2030 and New EU Strategy on Climate Adaptation to make Europe a climate-resilient society by 2050. All these measures are fully adapted to confront the unavoidable impacts of climate change.

1. <https://www.cost.eu/>



Disclaimer

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ABOUT THE ENI CBC MED PROGRAMME

The 2014-2020 ENI CBC Mediterranean Sea Basin Programme is a multilateral Cross-Border Cooperation (CBC) initiative funded by the European Neighbourhood Instrument (ENI). The Programme objective is to foster fair, equitable and sustainable economic, social and territorial development, which may advance cross-border integration and valorise participating countries' territories and values. The following 13 countries participate in the Programme: Cyprus, Egypt, France, Greece, Israel, Italy, Jordan, Lebanon, Malta, Palestine, Portugal, Spain, Tunisia. The Managing Authority (JMA) is the Autonomous Region of Sardinia (Italy). Official Programme languages are Arabic, English and French. For more information, please visit: www.enicbcmed.eu

The European Union is made up of 27 Member States who have decided to gradually link together their know-how, resources and destinies. Together, during a period of enlargement of 50 years, they have built a zone of stability, democracy and sustainable development whilst maintaining cultural diversity, tolerance and individual freedoms. The European Union is committed to sharing its achievements and its values with countries and peoples beyond its borders.

