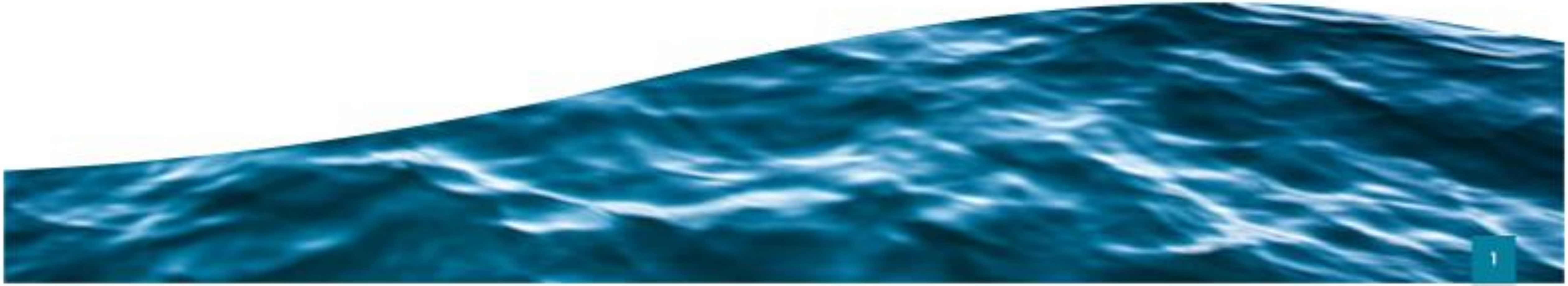
International Workshop
«Fostering Ocean Innovations»
Naples, September 4, 2023

Sector Study

Blue Economy on the Southern Shore of the Mediterranean

and related technological and market gaps



Study Preamble

Common challenges faced by the Southern shore countries of the Mediterranean Basin:

- Limited interaction among governance level and the Blue Economy ecosystem;
- Climate change impact on territories and society, especially in rural and coastal peripheric areas;
- Limited or no access to the international markets for the products and services offered by local operators;
- Weakness of integrated development strategies for coastal cities and rural areas (inland and along the coastline);
- Demographic increase combined with high unemployment rate (especially of youth and women), in rural areas and peripheral coastal zones;
- Need to secure integration of income for coastal communities related to fisheries and other rural activities;
- Strong emigration and subsequent lack of qualified operators in all Blue Economy sectors.

> Obtaining a detailed picture of the Southern shore Blue Economy is the basis for drafting a **path towards a more uniform/coherent response** to these gaps

Unemployment in Tunisia

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جدول 4: تطور نسبة البطالة (%) حسب الجنس 2020-2022

Tableau 4 : Evolution du taux de chômage (%) selon le sexe 2020-2022

	2020				2021				2022				
Sexe	الثلاثي 1	الثلاثي 2	الثلاثي 3	الثلاثي 4	الثلاثي 1	الثلاثي 2	الثلاثي 3	الثلاثي 4	الثلاثي 1	الثلاثي 2	الثلاثي 3	الثلاثي 4	الجنس
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	
Hommes	12,3	15,2	13,5	14,4	15	15,4	15,9	13,9	14,1	13,1	13,2	**12,9**	ذكور
Femmes	22	25	22,8	24,9	23,8	23,6	24,1	21,3	20,9	20,5	20,4	**20,1**	إناث
Ensemble	**15,1**	**18**	**16,2**	**17,4**	**17,8**	**17,9**	**18,4**	**16,2**	**16,1**	**15,3**	**15,3**	**15,2**	مجموع

جدول 5: تطور نسبة بطالة الشباب 15-24 سنة (%) حسب الجنس 2020 - 2022

Tableau 5 : Evolution du taux de chômage des jeunes 15-24 ans (%) selon le sexe 2020 - 2022

	2020				2021				2022				
Sexe	الثلاثي 1	الثلاثي 2	الثلاثي 3	الثلاثي 4	الثلاثي 1	الثلاثي 2	الثلاثي 3	الثلاثي 4	الثلاثي 1	الثلاثي 2	الثلاثي 3	الثلاثي 4	الجنس
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	
Hommes	33,7	36	35,4	41,8	40,4	42,3	42,8	42,1	39,8	37,4	38,5	**38,6**	ذكور
Femmes	35,2	37,3	36,2	44	41,6	40,4	41,7	35,7	36	36,7	36,2	**39,1**	إناث
Ensemble	**34,2**	**36,5**	**35,7**	**42,5**	**40,8**	**41,7**	**42,4**	**40**	**38,5**	**37,2**	**37,8**	**38,8**	مجموع

جدول 6: تطور نسبة البطالة (%) من بين حاملي الشهائد العليا، حسب الجنس 2020 - 2022

Tableau 6 : Evolution du taux de chômage (%) des diplômés de l'enseignement supérieur selon le sexe 2020 - 2022

	2020				2021				2022				
Sexe	الثلاثي 1	الثلاثي 2	الثلاثي 3	الثلاثي 4	الثلاثي 1	الثلاثي 2	الثلاثي 3	الثلاثي 4	الثلاثي 1	الثلاثي 2	الثلاثي 3	الثلاثي 4	الجنس
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	
Hommes	16,1	18,6	17,6	17,1	17,4	15,3	15,8	14,1	14,6	13	15,2	**15,7**	ذكور
Femmes	38,3	42,1	40,7	35,5	31,5	32,5	33,1	30,4	31	31,5	32	**30,8**	إناث
Ensemble	**28**	**31,2**	**30,1**	**26,6**	**25,1**	**24,8**	**25,1**	**22,7**	**23,3**	**22,8**	**24,3**	**24,0**	مجموع

Source: Institut National de Statistique

Employment Tunisia by Sector

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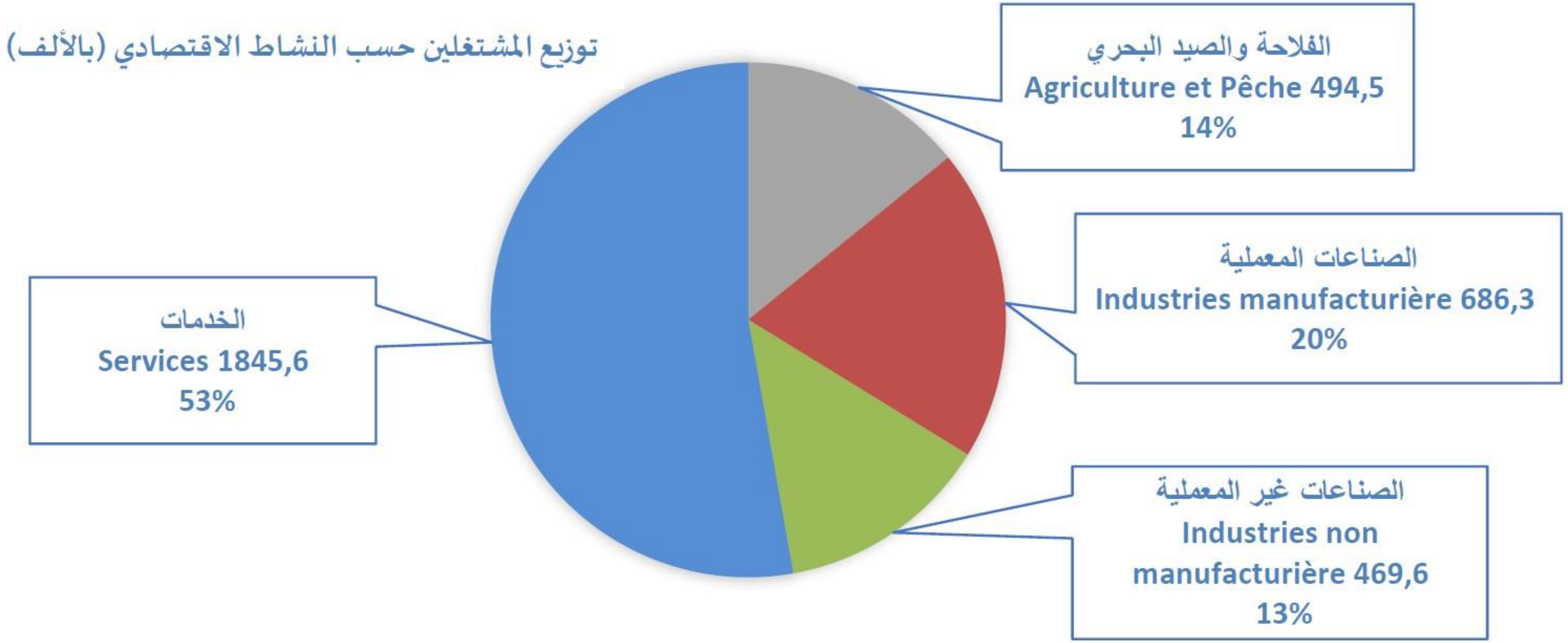

Source: Institut National de Statistique

Unemployment in Morocco

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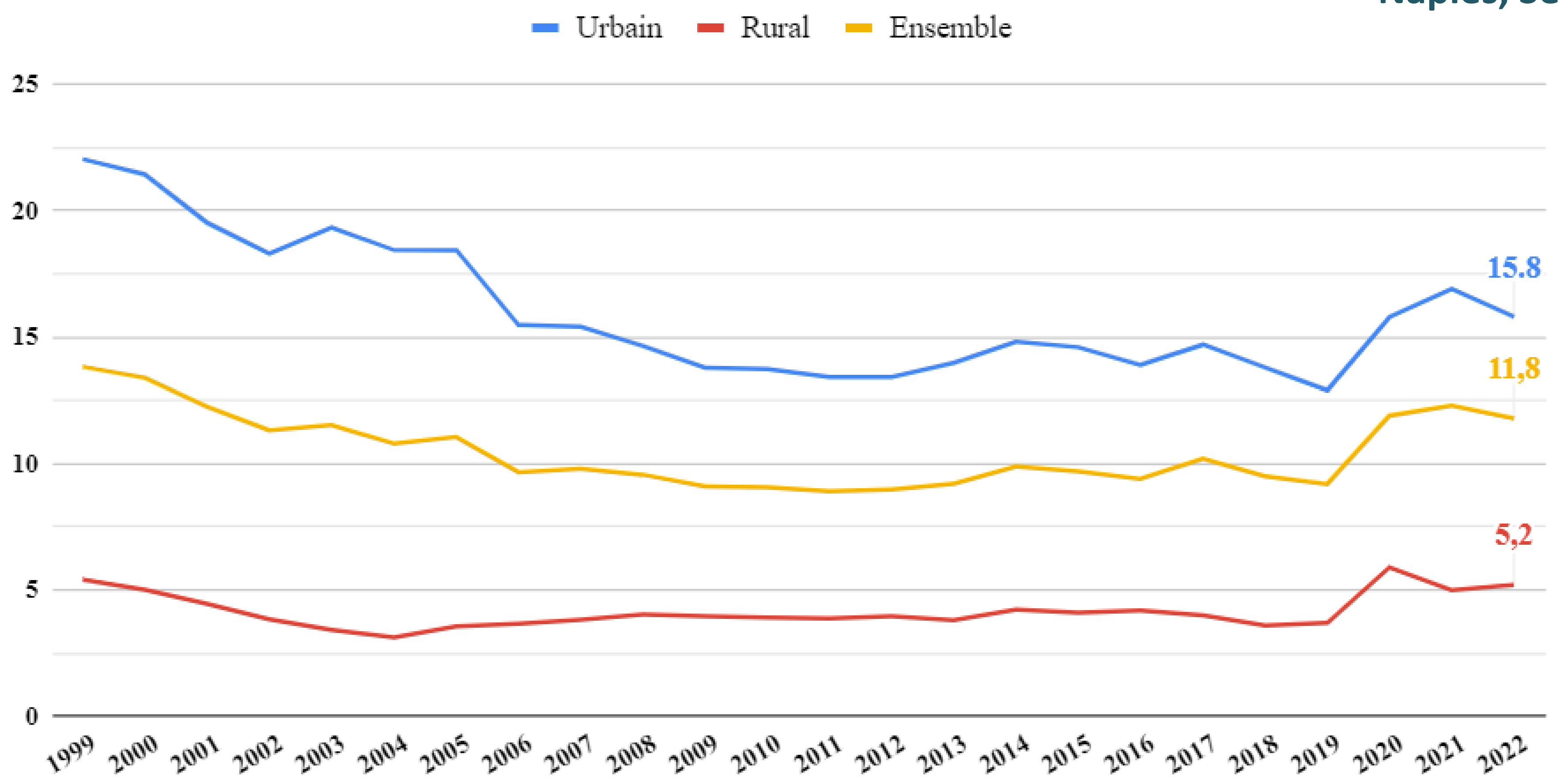

Source: Haut Commissaire au Plan

Unemployment in Morocco by level of education

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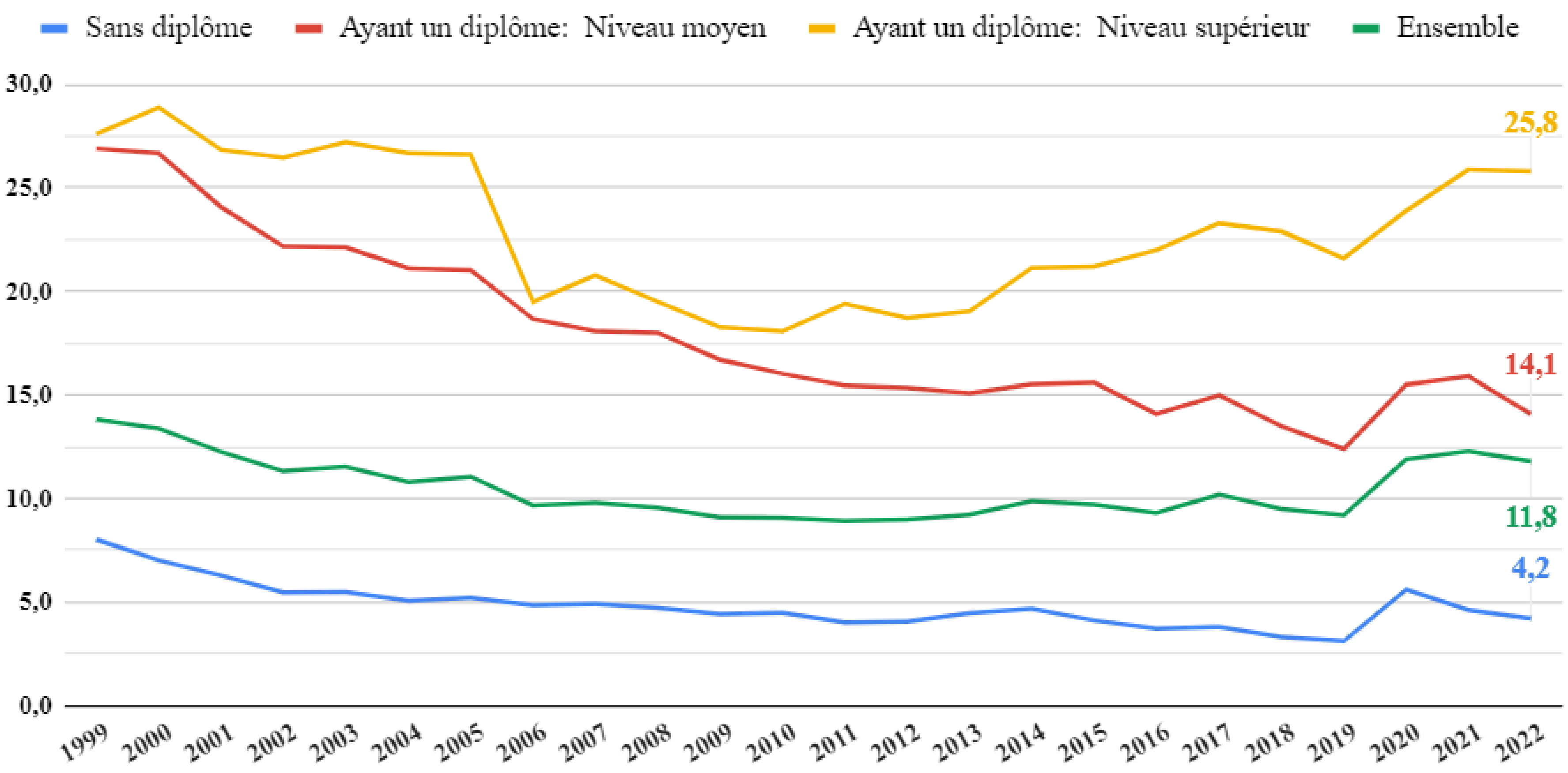

Source: Haut Commissaire au Plan

Unemployment in Morocco by gender & level of education

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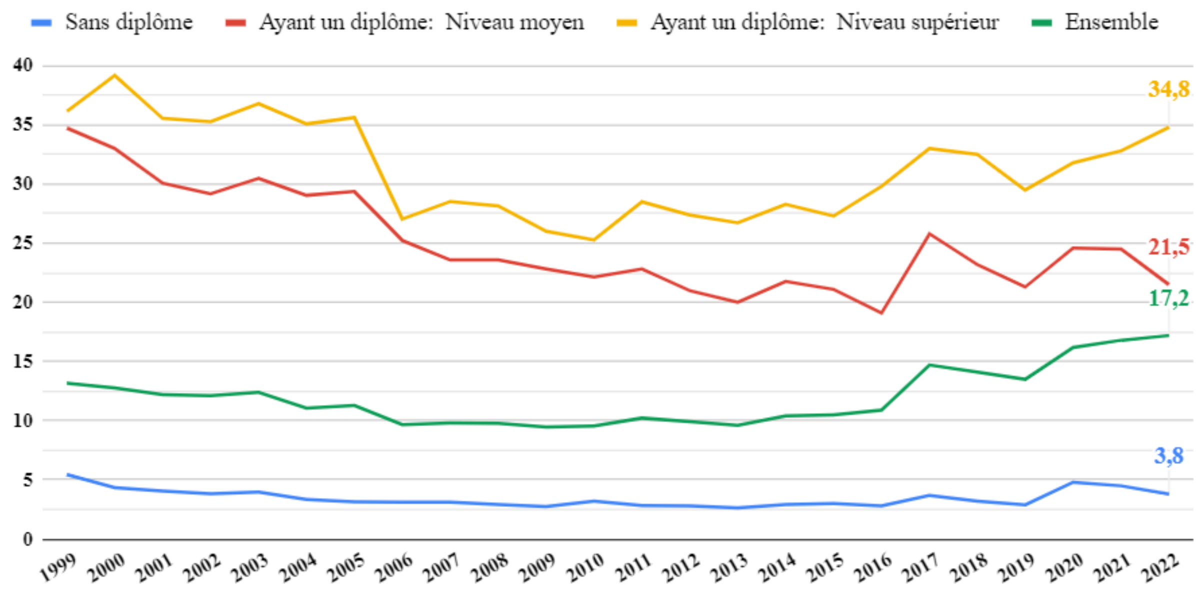

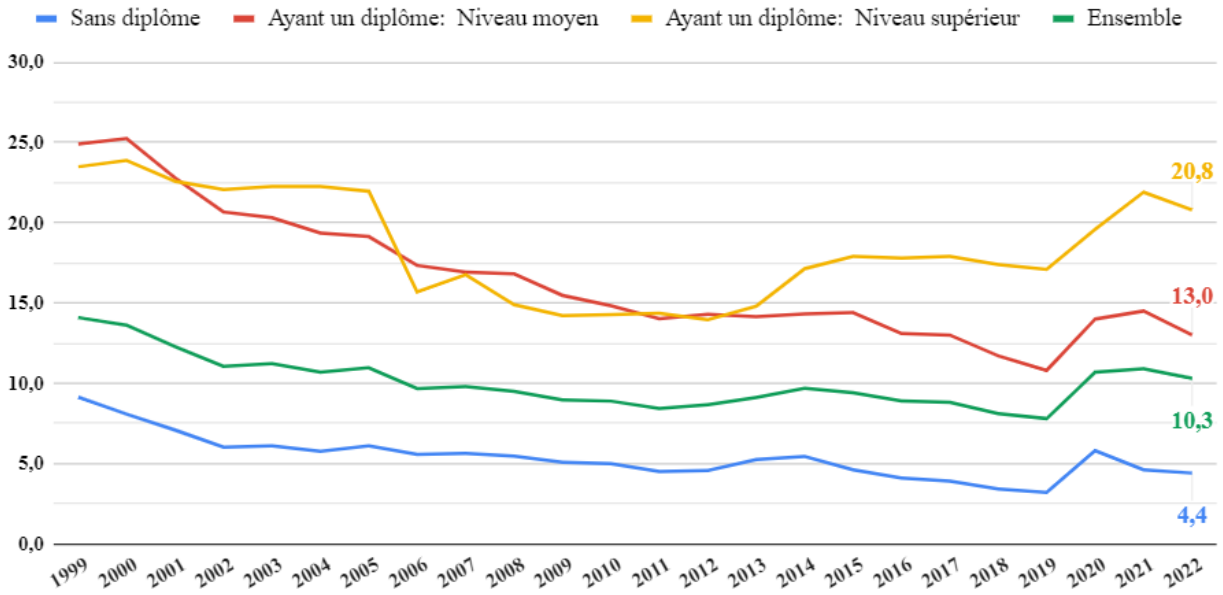

Source: Haut Commissaire au Plan

Unemployment in Morocco by area & level of education

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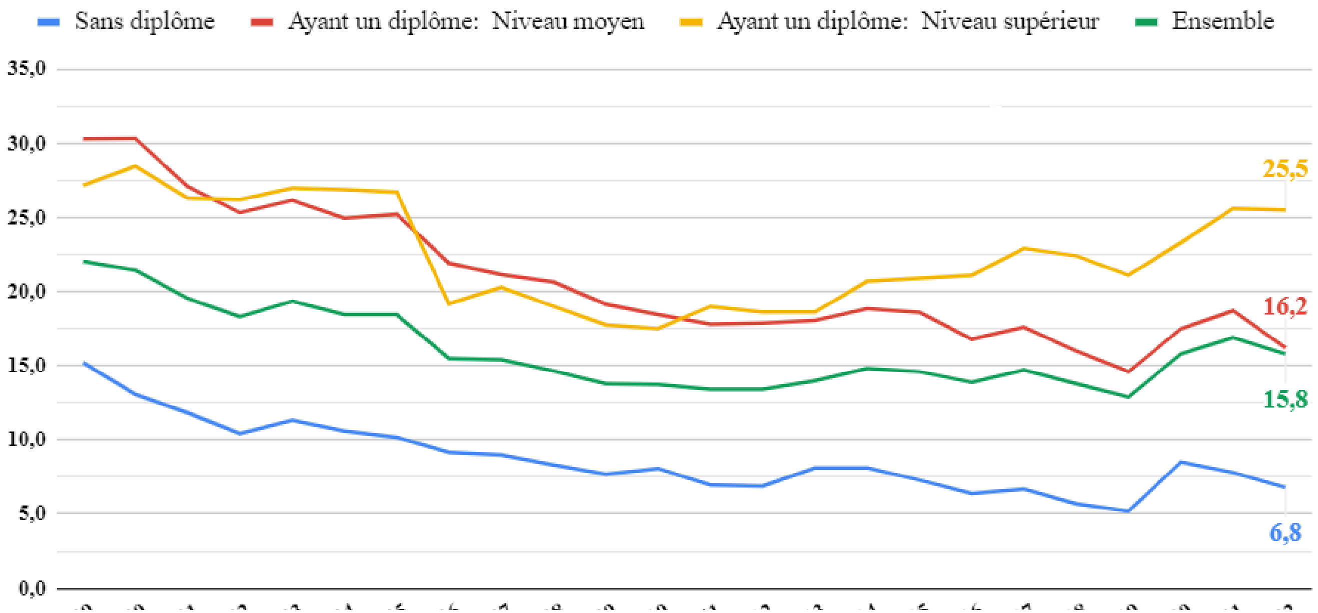

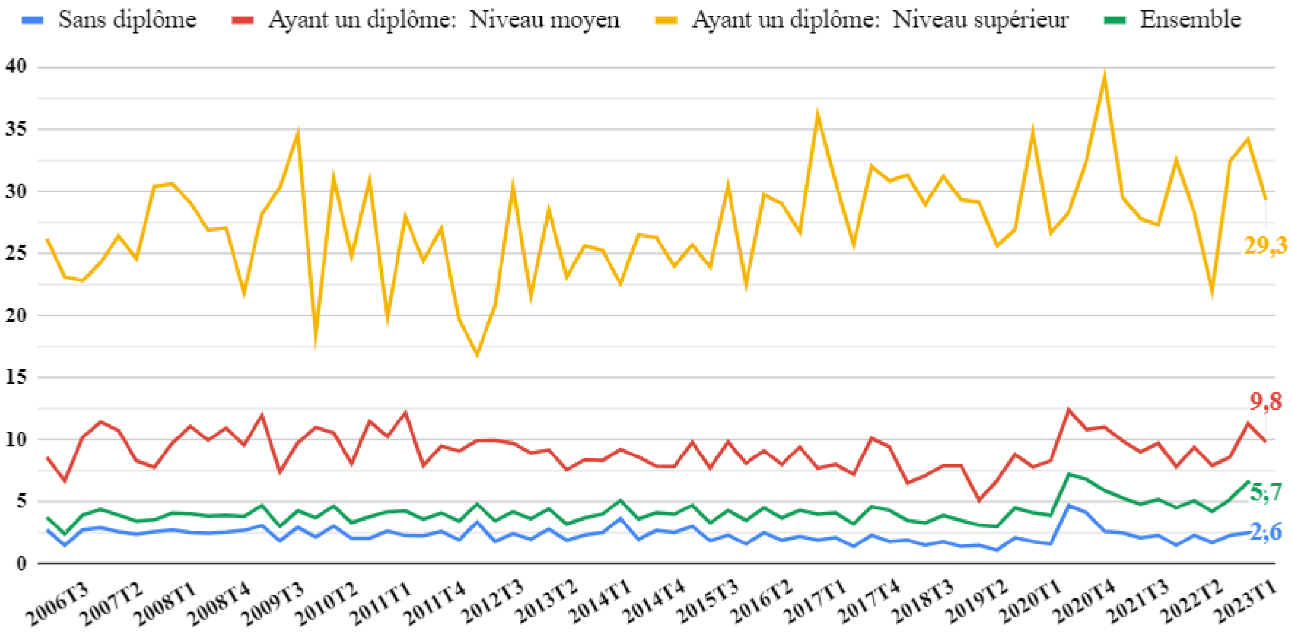

Study Perimeter

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CLUSTER BIG investigates the State-of-Play of the Blue Economy in

Algeria | Egypt | Libya | Tunisia

6 Sectors

- Aquaculture
- Data Collection,
  - Management,
  - Monitoring
  (Digitalisation, MSP, ICZM,AI, AR, VR, etc)
- Sustainable Maritime Transport
- Sustainable Tourism
- Marine Renewables/ desalination
- Blue Skills

to adopt a compass for its internationalization strategy in the Mediterranean Basin

Cluster BIG Strategic Objectives

Identify...

- Areas where CLUSTER BIG may undertake capacity building/ technical assistance activities towards Southern maritime ecosystems

- Most significant actors, with whom to interact as counterpart or partner for the capacity building/ technical assistance activities to be undertaken

- Possible funding sources, related to the outcomes of the previous two points

Study Goals

1. Define the **main gaps** between **Northern and Southern shore** (through overview of the technological landscape across the Mediterranean Basin, with a clear priority on most adopted solutions)

2. Identify the main dynamics in **R&I programmes**, **higher education and VET correspondance** to the market needs in terms of Blue Skills, the intensity and complexity of networking of the whole ecosystem

3. Map the **public & private organizations**, who are able to trigger technological uptakes, adopt innovative solutions, scale-up the modernization of the whole ecosystem, through their capacity of transferring know-how to the economic operators

Study Methodology

Researchers have deepened their extensive knowledge of frameworks and trends in the different countries/ sectors (gained through Technical Assistance experience) by:

- A targeted literature study of the Mediterranean Basin focused on the designated countries and sectors (published by international, regional and sub-regional institutions, agencies, research institutes, etc)
- Customised questionnaires, filled-in by local sectoral experts, carefully selected from the vast international researchers' network

Local experts:

- Have provided a preliminary response to the questionnaire
- Have been available for a more detailed interview, elaborating on the most cryptical points of their answers
- Make use of todays' session to exchange with experts and receive feedbacks on preliminary outcomes and considerations

Main Findings 1/6

While the four countries show very different levels of governance, ecosystem development and integration of operators, some general conclusions have emerged:

- Inadequate Blue Skills profiles offered by the educational and VET systems, versus the market opportunities, in terms of employability, research, entrepreneurship.
  (This gap seems the main factor encouraging young professionals to seek opportunities abroad, depriving their countries from the decisive know-how to «drive and implement» the SBE of the future)

- Countries with a strong governance framework (legislation, gov’nt agencies, universities & research institutes, R&I programmes, incentives to investments, public companies) often miss a real ecosystem of private operators (Algeria, Libya and Egypt are at very different levels). In these cases universities are the most pro-active hubs for this purpose, especially through accelerators & incubators.

- Countries with a traditionally dynamic landscape of SMEs (Tunisia), often miss a reliable governance framework and rely on universities & research institutes for R&I development and technology transfer role.
  - Spontaneous clustering initiatives express efficient networking dynamics.
  - Inclusion of operators in the international supply chains is much higher, even though for low-range solutions, at the very first stage

Main Findings 2/6

- Environmental awareness does not seem to be a common priority at institutional level, while environmental technologies seem to have a bright present and future,
- The predominance of mega-projects seem to prevent a real SBE achievement, but may allow the development of local supply chains in the short-run
- The meaning of «technological gap» may range from the need to promote local production of generally adopted solutions to the lack of advanced governance models & good practices, which may foster the achievement of significant results.
- The technological development of each country is mostly determined by its historical priorities, more than by the capacities of its scientists
- In most countries, the banking systems are not proposing targeted solutions on SBE paths
- Tech transfer has increased in speed and frequency between all countries because of digitalisation and exchange programmes

Main Findings 3/6

Mismatch/ large gaps between Northern and Southern shore:

- R&I environment
- Technologies and models
- Systems and processes
- Supply chains & economic landscape
- Skills, Entrepreneurship, Employability.

Main Findings 4/6

	Tourism	Transport
Algeria	Increase public awareness about importance of sustainable and eco-tourism. The country already shows a strong vitality of its ecosystem. Digitalisation is fundamental tool	Modernisation and new management tools for ports; Adaptation of existing fleet to new resolution regarding air emissions, implementing indexes such EEXI,EEOI,EEDI (Retrofitting); New Shipyards; Improving Maritime services
Tunisia	There is a national strategy. Traditionally well-performing, need to diversify into 'niches'. It misses coordination and regulatory framework in the «plaisance»	Need to implement complete digitalisation of the sector. Development of alternative fuels. Passenger transport as an opportunity. Deep water port Enfidha.
Lybia	The sector is characterized by the State's dominance over economic activity. Large potentials to be exploited requiring political stability	Shortages and the use of advanced technologies in shipping, unloading and storage equipment (cranes, etc). Missing a full study of the state of the ports and a development plan
Egypt	Importance of new MPAs for the immediate future (from 3 to 9). Conflict EEAA and Ministry of Tourism for Evaluation Impact Assessment	Poor supply chain for OPS. Absent modern technology in monitoring process, applying and implementing environmental laws and regulations

Sector development: None | Mild | Growing | Strong

Main Findings 5/6

	Aquaculture	Renewables/ Desalination
Algeria	Need to increase volumes of local production of final produce, feed, equipment, systems	Desalination: need to develop local production of membranes, while tech transfer for sustainable solutions (PV) to be scaled up
Tunisia	Urgent to modernize technologies used, with SMART systems, through faster tech transfer from research institutes. Increase of national production.	Desalination: conversion of traditional plants to the photovoltaic technology. Green hydrogen
Lybia	Large potential (also for inland plants), but need awareness/ priority at government level. Need to adopt sustainable business models	Need to introduce an economically-financially sustainable model, since the cost of oil & gas related production of electricity is still too competitive, in comparison.
Egypt	Converting the traditional/ semi-intensive farms to the intensive aquaculture system, maximizing the return using re-circulating technologies (IPR), as well as on the removal of the organic wastes.	SCCP project is expected to scale up the adoption of marine renewable technologies and desalination plants

Sector development: None | Mild | Growing | Strong

Main Findings 6/6

	Digitalisation	Skills
Algeria	Better interconnection among actors who produce, collect and analyze data (i.e. Ministries). Need a platform to centralize these different data from the blue economy sectors. Real-time analysis of MSP or ICZM in a single system.	Lack of access to internet and mobile devices. Demand for digital skills and digital literacy. Needed a general platform of BE stakeholders to increase exchanges between industry and education, at all levels
Tunisia	Need to implement a MSP simulator, to define a legislative framework and an action plan	Need to develop legislation, more coordination between all national contributors and support the blue training, to develop partnership and adapt programmes to the most demanding sectors between European and African neighbours: in blue tourism, blue skills, blue incubators
Lybia	Overall situation very good thanks to dedicated agencies. More political stability will imply a definitive development of the sector	Potentials to be exploited requiring political stability: digititalisation, lack of trainers' development, and the interaction with development institutions is weak or almost negligible
Egypt	Poor planning and integration between ocean maritime zones. Quite poor land use plans. Absence of continual surveillance and fishing during prohibited times. No Vessel Monitoring System (VMS).	No link between education system and market requirements. Increasing illiteracy of women in rural regions

Enablers. *Clusters and 'aggregators' for technological uptake*

A vibrant blue economy requires the uptake of innovation and technologies, but local businesses and other stakeholders across **innovation ecosystems do not operate in a vacuum.**

Strong enabling support should be provided by different forms and types of 'aggregators' – i.e. intermediary bodies that allow an efficient and effective aggregation of local needs and act to supply the financing, networking and know-how needed to uptake relevant technologies.

The **presence and distrubution of such 'aggregators'** (clusters, governmental bodies, associations, accelerators/incubators, as well as researchcentres/universities and banks/foundations) across the various blue economy sectors **varies largely across countries**.

- *Support of **governmental bodies** (mainly national) remains a key driver across countries*
- *Innovation **clusters** are growingly recognised but largely absent (with notable exceptions)*
- *National champions and **business associations** vary sensibly across countries/sectors*
- ***Accelerators and incubators** are often underdeveloped (again with notable exceptions)*
- ***Foundations and investment banks** are active but not specifically towards maritime sectors*

Emerging suggestions: clusters' 'enabling' role

*The **blue economy is a growing area of opportunity** for socio-economic growth in the assessed countries. It also **increasingly provides and area for internal cooperation** across stakeholders, for example:*

- *Policymakers (national/local)*
- *Research and innovation centres*
- *Businesses (and sectoral bodies/associations) across value-chains*
- *Investors and incubators/accelerators*

*All the **actors above have gained certain degrees of relevance** in the blue economy activities across each country, clearly with differences that reflect the specificities of each country, for example:*

- *Greater role of policy frameworks and accelerators in Algeria*
- *Stronger business environment (and emergence) of the blue economy cluster in Tunisia*
- *Strong potentials for Egypt and some niche areas for Libya (e.g. telecoms and IT)*
- *Increasing role and/or future potentials for universities and research centres (overall)*

*And yet, **greater synergies are required in bringing all the different actors together** – as to strengthen cooperation between universities, businesses and investors, while offering sound 'policy frameworks', and provide the opportunity to address the technology, skills and market gaps that have been highlighted in our study.*

*This aspect offers an **immense opportunity for blue economy clusters to act as 'enablers'** in bringing different stakeholders together – which in turns requires stronger presence and capability for national clusters.*

Some remarkable dynamics in the investigated countries: Algeria

Algeria is consolidating its action in favour of entrepreneurship, through the:
-better matchmaking between R&I and entrepreneurship;
-intensification of the support to entrepreneurship, through accelerators, incubators, investment funds.

-Consolidated regulatory framework (definition of start-up, relevant critieria, etc);

-Role of ANVREDET (Agence national de Valorisation des Résultats de la Recherche et du Développement Technologique);
-The Algerian Start-up Initiative (2011);

-Algeria Venture, public accelerator (est. 2020) with international agreements with US' SEAF and Italy's CDP;

-Algerian Start-up Fund (est.2020);

-Algeria Startup Challenge (est. 2018) - Aquatech Startup Challenge 2021-2022;

-Under the supervision of the Minister of Higher Education and Scientific Research, Algeria relies on 78 entrepreneurship houses and 44 incubators;

-Identification of 5000 tech entrepreneurs - 1200 labelled start-ups by the Algerian government.

Some remarkable dynamics in the investigated countries: Egypt

Egypt is speeding up the scale-up of its large R&I investments to widely impact on the country's sustainability, through the:

-SCCP project and its implications on the many sectors involved;

-the tightening of industrial and commercial partnerships at international level, for all fields of the Blue Economy (see Alexandria Port involvement in many EU funded projects).

Some remarkable dynamics in the investigated countries: Libya

-*The Ministry of Marine Wealth has prepared a development plan for sustainable aquaculture, focusing on 8 national sites;*

-The recent decentralization law in favour of municipalities is empowering local administrations, as active providers of public services to communities on territories and interacting with the stakeholders of the relevant fields of competence, producing an impact on social-economic dynamics on the relevant areas;

-Libyan Export Promotion Center and the Libyan Local Investment and Development Fund are actively supporting investors and initiatives, exploiting the potential of the main economic sectors (Blue Economy among them), especially towards diversification from Oil&Gas.

Some remarkable dynamics in the investigated countries: Tunisia

Within the MoU for Cooperation and Development 2021-2023 between Italy and Tunisia – the Support Programme to the Green and Blue Development in Tunisia is implying two main driving actions:

-the support to the organic agriculture, through the establishment of bio districts - Bio territories - (BIOTUNISIE);
-the support to the Blue Economy through the assistance to productive coastal zones, according to principles of sustainability and competitiveness (BLEUETUNISIE);
-the realisation of the logistic hub in Sidi Bouzid, for the processing and valorization of agricultural produces.

BLEUETUNISIE is focusing on
Investments for competitiveness
-Rehabilitation and redevelopment of coastal fishing ports and artisanal fishing shelters;
-Rehabilitation of technical vocational training centers and research;
-Financial support for local small businesses and GDAP/SMSAP (artisanal fishing, sustainable aquaculture, tourism, SSE)

Technical assistance, training, research and innovation
-Support fund for the industrialization of promising research and innovation projects.

Sustainable and participatory planning and management of coastal areas.

Conclusions

	Short term	Mid term
Algeria	Need of capacity building support in developing: -its own ecosystem, bridging the new generation of stakeholders from “in-house” academic environment, incubators-accelerators, to the market contest; -local production of products and services.	Algeria is the suitable country to partner with in R&I for strategic sectors, targeting its qualified system of national agencies and universities.
Egypt	Industrial cooperation in the high growth sectors, through a common strategy of joint investments, beside the strong public intervention for the development of local productions.	Need of capacity building support in developing its own ecosystem, beside the top-down public investments and support programmes. Egypt could be the suitable country to partner with in R&I for strategic sectors, just like to tackle environmental and climate change challenge, targeting its qualified system of research institutes and universities.

Conclusions

	Short term	Mid term
Libya	Identify local partners, mostly within the good landscape of universities and of municipalities, to include in the regional R&I network	Need of capacity building support in: -developing institutional awareness in sustainable sectors, still absent, but already targeted by local entrepreneurs; -the identification and adoption of environmentally, economically and financially sustainable models, in all Blue Economy sectors.
Tunisia	Foster cooperation in the high growth sectors, through a common strategy of investments, for the development of local productions, beside the increasing inclusion of Tunisian R&I institutions in Euromediterranean networks	Need of capacity building support in institutional and governance frameworks.

Possible common regional response

In consideration of the:

-common challenges to be tackled;
-very much diverse national landscapes of R&I and enterprises, and their limited regional integration;
-different governance models, with various degrees of centralisation/decentralisation;
-diversified Blue Economy strategies, with different goals and priorities

the importance to attract investments may represent a decisive factor to speed-up the development of the Sustainable Blue Economy ecosystem on the Southern shore.

But in order to show investors an understandable regulatory framework, with clear rules, commitments, obligations & duties, it could be useful to adopt a common regional scheme for (foreign and domestic) investment attraction in the Blue Economy, whose incentives and mechanisms could be calibrated according to the national and local goals, priorities, opportunities and, incentives.

The adoption of such a common scheme could better contribute to the homogenization of the SBE, with increase of competitiveness towards the export markets and the valorization at regional level, of local specializations

Possible common regional response

In consideration of the:

-high unemployment rates, especially for youth and women;
-larger impact of unemployment on more qualified students;
-urban areas attract more qualified youth than rural areas;

the importance to intensify education paths and training programmes according to the market requirement is fundamental, but not enough.
It is necessary to optimize a tool to "canalize" young students directly into companies, research institutes, Public administrations, according to their skills.

This would soon create a strong uptake of employment, since many sectors are requiring young qualified operators, without finding them.

New Ideas
the south eastern attitude
Business Consulting & Development
Internationalization

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NEW IDEAS DI MANZARI L. & C. SAS
Via Matteo Renato Imbriani, 48 | 70121 Bari | Italy
PARTITA IVA : IT 06677480722
info@new-ideas.eu new-ideas.eu +39 080.89.66.360