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Agenda Item 5: Ministerial Session

MED 2050: Foresight study for the Mediterranean by 2050

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UNEP/MAP
Athens, 2023

MED 2050

Foresight study for the Mediterranean by 2050

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List of acronyms and abbreviations

ADEME	Agence de l'Environnement et de la Maîtrise de l'Énergie (French Agency for Ecological Transition)
AFD	Agence Française de Développement (French Agency for Development)
AMU	Arab Maghreb Union
ASCAME	Association of Mediterranean Chambers of Commerce and Industry
ASEAN	Association of Southeast Asian Nations
BaU	Business-as-usual
CBD	Convention on Biological Diversity
CIHEAM	Centre International de Hautes Etudes Agronomiques Méditerranéennes (International Centre for Advanced Mediterranean Agronomic Studies)
CIRAD	Centre de Coopération Internationale en Recherche Agronomique pour le Développement (French Agricultural Research Centre for International Development)
CMI	Centre for Mediterranean Integration
COP	Conference of Parties
CPMR	Conference of Peripheral Maritime Regions
DEGEST	Demography, Environment, Governance, Economy, Society, Technology
EC	European Community
EEZ	Exclusive Economic Zone
EIB	European Investment Bank
ENSA	École Nationale Supérieure d'Architecture (National School of Architecture)
ENSSMAL	École Nationale Supérieure des Sciences de la Mer et de l'Aménagement du Littoral (National School of Marine Sciences and Coastline Planning)
ETC-UMA	European Topic Centre, University of Malaga
EU	European Union
GAFAM	Google, Amazon, Facebook, Apple, Microsoft
GDP	Gross Domestic Product
GHG	Greenhouse Gas
IEMED	Institut Européen de la Méditerranée (the European Institute of the Mediterranean)
IFREMER	Institut Français de Recherche pour l'Exploitation de la Mer (French Research Institute for the Exploitation of the Sea)
IIASA	International Institute for Applied Systems Analysis
IMO	International Maritime Organisation
IPBES	Intergovernmental Science and Policy Platform on Biodiversity and Ecosystem Services
IRES	Royal Institute of Strategic Studies
ITES	Institut Tunisien des Etudes Stratégiques (Tunisian Institute for Strategic Studies)
IUCN	International Union for the Conservation of Nature
KIC	Knowledge and Innovation Community
MAP	Mediterranean Action Plan
MedECC	Mediterranean Experts on Climate and environmental Change
MERCOSUR	Southern Free Trade Agreement
MIO-ECSDE	Mediterranean Information Office for the Environment, Culture and Sustainable Development
MPA	Marine Protected Area
MSSD	Mediterranean Strategy for Sustainable Development
MTES	French Ministries of Ecology, Energy and Territories
NAFTA	North-American Free Trade Agreement
NATO	North-Atlantic Treaty Organisation
NDC	Nationally Determined Contributions
NGO	Non-Governmental Organisation
OME	Observatoire Méditerranéen de l'Énergie (Mediterranean Energy Observatory)
PAP/RAC	Priority Actions Programme/Regional Activity Centre
RAC/SPA	Regional Activity Centre for Specially Protected Areas
RAED	Arab Network for Environment and Development
RE	Renewable Energies
REMPEC	Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea
SCP	Sustainable Consumption and Production
SCP/RAC	Regional Activity Centre for Sustainable Consumption and Production
SDG	Sustainable Development Goal
SEMC	South-East Mediterranean Countries
SoED 2020	Report on the State of the Environment and Development in the Mediterranean

UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
WB	World Bank
WTO	World Trade Organisation
WWF	World Wildlife Fund

Introduction

In December 2019, the 21st Ordinary Meeting of the Contracting Parties to UNEP/MAP (COP 21, Naples, Italy) definitively decided, after a long preparation phase, to launch a foresight study on the Mediterranean in 2050, with three objectives:

- analyse the conditions for effective protection of the Mediterranean marine ecosystem over the next 30 years;
- provide long-term insights that will help the region make the transition to sustainable development;
- and lastly, prevent major risks of crisis or disruption that could have a decisive future impact on these two objectives of protecting the sea and ensuring the sustainable development of the region.

This exercise was entrusted to Plan Bleu, whose initial vocation and one of its permanent functions within the UNEP/MAP Regional Activity Centres is to carry out foresight work on the Mediterranean.

This report is not the final document. It summarises most work completed under MED 2050 since early 2020, during a period marked by Covid, which severely limited face-to-face exchanges that are, in principle, essential to such an exercise. It focuses on the scenarios that have been produced, published here in their entirety. Work carried out prior to this has already been explained in a detailed report in 2020. The first two parts outline the method used and some very brief details about the foresight base built to underpin the scenario assumptions. The third section presents these scenarios, followed by a conclusion that includes discussion of the next steps.

The specific features of MED 2050 compared to previous foresight exercises.

MED 2050 is not the first foresight exercise carried out by Plan Bleu, which has coordinated and published two other foresight reports in 1989 and 2005. These two foresight studies have served as a reference for preparing environmental and sustainable development policies in the Mediterranean, including the Mediterranean Strategy for Sustainable Development (MSSD), and have supported regional, national and sectoral planning in multiple fields. However, the approach used in this new exercise differs quite significantly from previous ones. One of the reasons for this is that the Mediterranean context has changed considerably since 2005 (considerable acceleration of climate and environmental change, national, regional and global geopolitical upheavals, the Arab Springs, new digital economy, etc.). Since then, the world has entered a period of turbulence with risks of disruption, making the outlook for the future much more uncertain. For example, considering the climate, predictions for 2100 may now be possible as early as 2050, which is bound to cause a great deal of instability over the next 30 years. In this context, it is no longer essential to predict precisely what is going to happen in 2050 in all areas, but to be able to adapt to very different possible futures, and potentially unforeseen shocks. The second reason is that the way of considering the sea and the oceans has changed, with much greater international concern about the challenges they encounter, their long-term transformations and the threats they face. This has further justified the decision to refocus MED 2050 on the marine ecosystem. Thirdly, difficulties in the Mediterranean context and the tendency towards increasing fragmentation have made it more necessary now than ever before to give an important place to the diversity of expectations and visions expressed by Mediterranean stakeholders. This explains the initial ambition of a more participatory approach, which has only been partially achieved. Lastly, the exercise was conducted with a view to going beyond building alternative scenarios for the future, with their risks and opportunities, in order to also produce the materials needed to debate realistic transition pathways to achieve them. Debates in the various Mediterranean sub-regions should be able to get underway in 2024.

A foresight rather than forecasting approach

For all these reasons, the choice was made to opt for a foresight approach rather than a forecasting approach. The two mechanisms are often confused, and foresight, like forecasting, is often expected to provide figures about what will happen as precisely as possible (e.g.: in 2030, 2040, 2050, etc.). But foresight differs from forecasting in two ways. Firstly, it is as interested in uncertainties as certainties. Secondly, it focuses as much on what is going to happen (exploratory foresight) as on what one might want or not want to happen (normative foresight). Foresight is therefore about exploring all the possibilities (and not just what is probable), and finding the right balance between the four different dimensions set out in the table below:

Present-future relationships / Relationship to uncertainty	Exploratory approach (from the present -> to the future)	Normative approach (from the future -> to the present)
Search for certainty	Forecasts	Visions of the future

	WHAT IS PROBABLE	WHAT IS DESIRABLE OR UNACCEPTABLE
Identifying and taking account of uncertainties	Foresight of disruptions WHAT IS POSSIBLE OR NOT IMPOSSIBLE.	Strategic foresight PATHWAYS AND TRANSITIONS TOWARDS AN OBJECTIVE WITHIN AN UNCERTAIN CONTEXT

Table 1. The four dimensions of foresight

Although MED 2050 is based on figures (e.g. for climate or demographic trends) and uses monographs to produce figures for numerous variables, its main objective is not to predict energy consumption, quantities of fishing catches or the distances travelled by different modes of transport in 2050. Instead, it is a matter of intelligently articulating the four approaches described in the previous table (forecasts, visions, disruptions and transition pathways), in order to build essentially qualitative scenarios anticipating the main possible futures for the Mediterranean over the next thirty years, and the pathways to achieve or avoid them. This open approach is all the more important given that merely extending quantitative trends leads to very pessimistic outlooks for the Mediterranean.

The future of the sea seen through all its interdependencies

In line with the MAP's mandate, MED 2050 focuses on the future of the sea. Nevertheless, it is not a scientific model of the marine ecosystem. Instead, it takes into account all factors that may have an influence on its development, all its interdependencies, so that they can be acted upon with a view to preservation and sustainable development. One of the major changes integrated into the MED 2050 approach is the growing weight of a new category of interdependencies, which is the dependence of the Mediterranean Sea on developments that are largely external to the Mediterranean area.

Since the mid-1970s, the Barcelona Convention has made it possible to take into account an initial form of interdependence, linking the state of the sea to the activities and territories that have a direct impact on it: fisheries and the use of marine resources, maritime transport, pressure from coastal territories, pollution in catchment areas, protection policies, etc.

With the creation of the Mediterranean Commission for Sustainable Development (MCSD), a link was then established between these direct impacts and existing modes of development within countries and territories in the region - macroeconomic but also sector-specific development (industry, energy, agriculture, tourism, transport, etc.), with sustainable development and environment-development integration at its core.

With global change, geopolitical upheavals, energy and food security issues and competition for global resources, a third form of interdependence is emerging more strongly than in the past. The futures of the sea and the region can no longer be considered independently of their relationships with the global level and with transformations in the relationships between people and nature at the biosphere level. This new form of interdependence introduces an additional factor of instability and raises an issue of coordination between regional and international policies. Added to this, climate change will be a determining factor in the future, meaning that the sea will no longer simply be under the influence of human activities, but will itself have an increasingly significant impact in transforming the physical conditions of the region: reconfiguration of coasts under the influence of rising sea levels, changes in the water cycle linked to sea warming, etc. If we add to this the vital role that the Mediterranean Sea already plays in the region's identity and living conditions, it is yet another factor that justifies analysing the respective impacts of human activities and the sea in both directions.

MED 2050 has endeavoured to take these three levels of interdependencies into account. This need has complicated the system analysed in the exercise and led to an increase in the number of variables, as shown in the second part of this report. Factors of change outside the region played a greater role than in previous exercises. Nevertheless, in all the scenarios developed, the concerns of the Barcelona Convention remained central.

Need for and limits to overarching scenarios for the Mediterranean.

Sharing a threatened sea justifies the development and discussion of scenarios that cover the whole region in an undifferentiated manner. The sea is considered in the light of all its interdependencies, providing a rare opportunity today

for foresight of the Mediterranean in all its dimensions. This is an appreciable contribution to action. However, summarising the possible futures of the Mediterranean in a series of fifteen-page narratives (see Part 3) necessarily has major limitations, in a region marked more than anywhere else by enormous differences and inequalities in demographic, economic, social, political, cultural and other situations. The descriptions of the six scenarios try as far as possible to specify these differences. To overcome this difficulty, it was initially planned to organise foresight workshops by major Mediterranean sub-regions (North-West, Balkans, East, South), but this was not possible for a number of reasons (Covid, insufficient resources, difficulties travelling, etc.). These sub-regional workshops could not be replaced by the consultations with key figures, generally organised remotely to discuss visions of the future Mediterranean, by restricted workshops for debate with Mediterranean young people, or by the geographical diversity of the experts involved in the project (see appendix). Following this lengthy process of building a foresight base and overarching scenarios, reflection has only just begun regarding transition pathways. For the reasons above, this should now be continued in each sub-region, and even in willing local or national territories, involving a diversity of stakeholders, as proposed in the conclusion of this report. This document should therefore be seen as a stage in a process, not an end in itself.

Part 1: Organisation of the exercise and methodology

I. Project structure

1. A five-phase, ten-step approach

- **General approach**

The approach adopted for MED 2050 has been structured around five successive phases or “modules”:

1. First, a quantitative and qualitative phase, for building the foresight base, designed to analyse the Mediterranean system in order to explore the trends, disruptions and weak signals impacting any changes, and rank the issues (risks or opportunities) for the environment and sustainable development in 2030– 2050, on the basis of a more detailed analysis of around thirty variables.

2. A second phase of consultation with stakeholders regarding their different visions of the future development and environment of the Mediterranean, involving very diverse stakeholders (e.g. representatives of the political, economic and scientific spheres, environmental associations, youth networks) and experts from the three sub-regions in the South, East and North.

3. A third phase for the development of contrasting scenarios for 2030 - 2050, building on the previous work.

The six scenarios developed form the core of this report.

Beyond this:

4. A fourth strategic phase focusing on reflection and comparison of possible transition pathways towards sustainable development, based on the previous scenarios and involving both experts and stakeholders from the Mediterranean sub-regions. The concluding section of this report looks at ways of approaching this phase.

5. Finally, a last phase to disseminate the results, with several potential audiences: the UNEP/MAP-Barcelona Convention system, the countries in question, the general public, the media and civil society, the scientific community, etc.

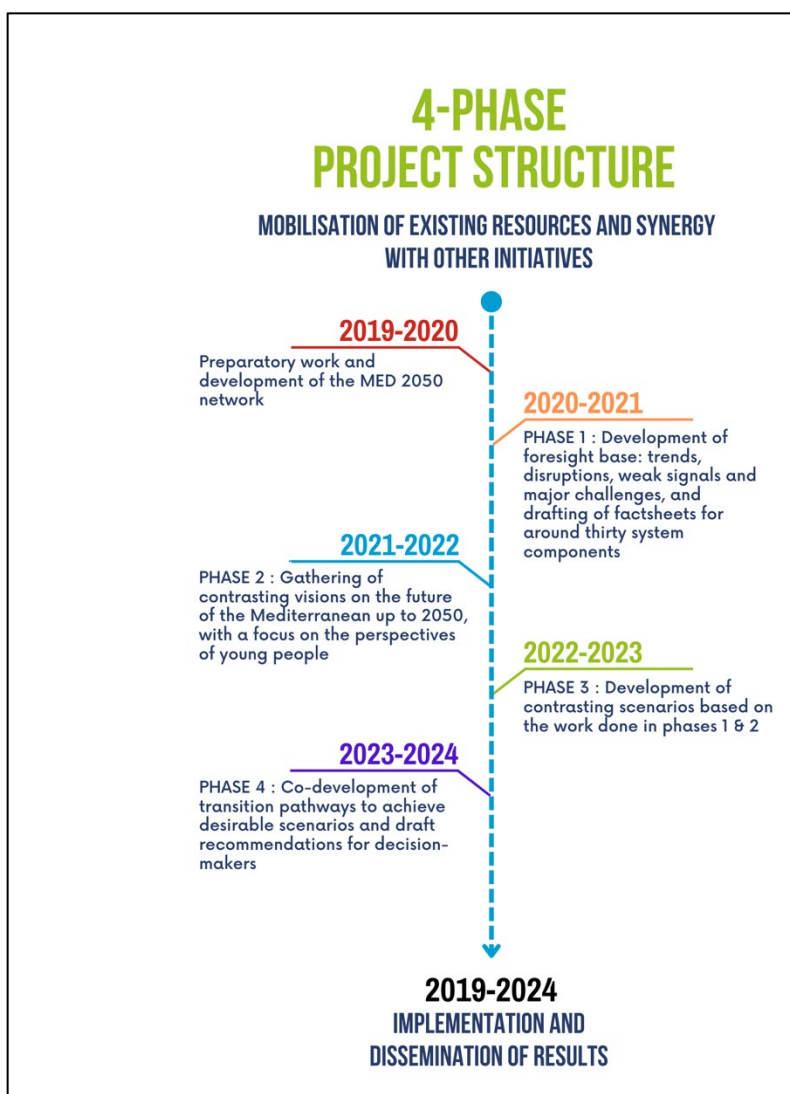


Figure 1. Flow chart of main project phases

- **A ten-step methodology**

This five-phase approach has been broken down into ten successive steps, which provide a more methodological framework for the continuity of the exercise. These ten steps are presented in the following table, which details the objectives for each step, the method(s) proposed, the resources, people or groups involved, and finally the expected final outputs.

Phase	Step	OBJECTIVES	METHODS	MEANS	OUTPUTS
I	1	Build a foresight database	Collect retrospective and foresight documents and statistics	Plan Bleu internal work and specific studies	A few monographs and projections for 2050. Analysis of 2005 project results. Comparison of 2005 project projections with current status. Major trend database.
I	2	Find consensus on trends, disruptions, weak signals and major issues	Expert consultation method (Régnier abacus, etc.) and discussions	Foresight group meetings and questionnaire analysis	List of trends, disruptions, weak signals and issues classified in several levels and qualified
I	3	Break down the system into major components and driving variables	Process the results from Steps 1 and 2 and use of the DEGEST framework	Foresight group meetings with the support of Plan Bleu	Production of a system framework and a list of components to be used as a basis for the scenarios
I	4	Analyse the components and make assumptions about their changes	Write factsheets on about thirty components	Involvement of the group, Plan Bleu and other experts	Approximately 30 sheets of about 10 pages each, concluding with 4 to 5 sets of assumptions for 2050
I and III	5	Produce exploratory scenario outlines based on the assumptions about the variables	One- and two-round morphological analysis (based on component assumptions)	Foresight group meetings with the support of the Plan Bleu team	10 to 12 scenarios from the morphological analysis - summarised in a few lines and key words
II	6	Produce contrasting normative outlooks of development and the environment by sub-region: (Eastern - Northern - Southern)	Prepare outlooks for the future of development and the environment by sub-region	Consultation of players or experts from the 3 zones OR work in workshops	Report on the differences in Eastern, Northern and Southern outlooks, and enrichment of exploratory scenarios
II and III	7	Production of regional sub-scenarios (Northern - Southern - Eastern)	One-round morphological analysis: 3 to 5 assumptions per sub-region.	Work in workshops with or without specific studies	4 to 6 scenarios "territorialising" those of step 5 with geopolitical aspects
III	8	Develop the final scenarios (4 to 6) by integrating the above-mentioned research	Group work	Foresight group meetings extended to other stakeholders with the support of Plan Bleu	4 to 6 scenarios integrating exploratory and normative dimensions and sub-regions
IV	9	Develop transition pathways to achieve desirable scenarios or prevent the major risks of others	Backcasting method on the scenarios considered the most useful in relation to sustainable development or crisis risks	Extended foresight group including experts and stakeholders	Production of strategies adapted to the different possible change scenarios for the Mediterranean
V	10	Produce recommendations and key messages for stakeholders and develop a strategy for promoting the work	Develop recommendations. Write the report. Choose promotional media and strategies by target group.	Ad hoc working group. MAP Steering Committee and bodies. Plan Bleu. Communication services	Complete final report Executive Summary Communication strategy and associated media. An effective communication strategy.

Table 2. A ten-step methodology

2. Proposed foresight methods

Each of the previous steps (Table 2: A ten-step methodology) is designed as a stand-alone component with specific outputs. However, the project can only be meaningful and coherent if these modules are structured around a common

method in order to integrate the various results and work towards the final goal of recommending realistic transition pathways for achieving sustainable development in the Mediterranean by 2050.

The main goal is to develop robust, plausible and contrasting scenarios on the future of the Mediterranean Basin, including the marine area, for 2050. Then, based on these scenarios, the aim is to propose transition pathways and recommendations for working towards one or more desirable scenarios and strengthening the resilience of the region in the face of likely future disturbances and major risks. The essence of the approach is the standard scenario-based method¹, coupled with a system analysis framework derived from the DEGEST approach², and the implementation of a “backcasting” approach (i.e. working back from the future to the present), in order to define and compare transition pathways³. Morphological analysis is also used to structure the framework of these scenarios around morphological charts that cross-reference the driving variables of the Mediterranean system and its development assumptions. The aim is also to combine overarching foresight across the basin with specific consultations or reflections to explicitly present the different visions for the future of the Mediterranean (particularly in terms of development and the environment) held by a variety of stakeholders and actors in the region, from both the North and South. With the same aim of avoiding scenarios that are too abstract and general, the approach also focuses on basing the scenarios on a minimum of quantitative data, extensive consultation with experts or stakeholders and the production of detailed thematic analyses, if possible at sub-regional level (“factsheets or thematic sheets”). Some of these tools are summarised in Box 1 below.

Box 1. Brief description of the main tools used in the MED 2050 approach

- **The scenario-based method** uses assumptions about variables or components of a system to develop representations of possible futures (exploratory scenarios) or desirable and undesirable futures (normative scenarios or outlooks). It generally includes three phases: developing a database and analysis and identifying the essential variables and components of the system being studied; scanning the field of possibilities, first by variable and component and then, more globally, from a "composition" of these specific assumptions (i.e. "morphological analysis"); and finally developing the scenarios themselves - which may (or may not) include normative elements.
- **A system analysis framework: the DEGEST approach.** The DEGEST approach was proposed by the American futurist Cornish in 2004, and suggests structuring analysis of the variables and components of the system studied around six major aspects: Demography, Environment (and resources), Governance, Economy (and finance), Society, and Technology (and science). It offers a useful analytical framework for organising the classification of components, then variables and trends or disruptions specific to the chosen foresight theme, at a more detailed level - or for building scenarios.
- **Backcasting scenarios.** Unlike forecasting, which starts from the present to make projections or assumptions about the future, backcasting scenarios start from objectives or desired outlooks for a given timeframe and work back to the present. It involves imagining the pathways required to reach a desired future or to avoid a feared future.
- **Morphological analysis** explores possible futures in a systematic manner based on all the combinations from breaking down a given system. It is used to build scenarios, in a progressive process that breaks down the system into more or less detailed levels (in variables, components, subsystems), and then rebuilds it.

¹ Source : Michel Godet, Philippe Durand, Strategic Foresight for corporate and regional development, DUNOD et UNESCO, April 2011.

² Source : E. Cornish, Futuring: the exploration of the future, World Future Society, 2006.

³ This combination of the scenario-based method, the DEGEST approach and backcasting has already been tested in many countries, particularly under the PEGASO programme focused on Integrated Coastal Zone Management (ICZM, 2010-2013) and in various European and bilateral training programmes in North Africa, Morocco and Egypt (2013-2018).

II. Organisation and participatory approach

MED 2050 uses a participatory foresight approach, and as far as possible⁴, Plan Bleu has applied this methodology throughout the different programme steps and at different levels. First of all, in the organisational structure implemented from the start of the programme, with the establishment of different bodies with specific and complementary roles:

- A steering committee comprising the Plan Bleu team, dedicated to operational implementation of the programme, and two Plan Bleu board members with sound experience in the field of foresight;
- A foresight group comprising experts from the three shores of the Mediterranean, specialising in themes considered important for the future of the region: economy, urban planning, coastline and sea, biodiversity, climate change, sociology, geopolitics, security, development, youth, agriculture, water, etc. Some experts are permanent members of the foresight group, while others assisted on occasion⁵. Their role was to ensure the consistency of all contributions and analyses, through joint synthesis work carried out during working sessions held regularly since the group's creation (May 2020), and until its work is completed;

Name and surname	Organisation
Members in charge of facilitating the MED 2050 Foresight Group	
AMINE Khadidja	Responsable développement durable et prospective (Plan Bleu)
LACROIX Denis	Vice-Président en charge de la Prospective (Bureau du Plan Bleu)
THEYS Jacques	Vice-Président en charge de la Prospective (Bureau du Plan Bleu)
TODE Lina	Directrice adjointe (Plan Bleu)
List of the Foresight Group permanent members	
BERGERET Pascal	International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM)
BESSAOUD Omar	International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM)
BOERO Ferdinando	University of Naples Federico II
CAPPATO Alberto	Old Port of Genova
CRAMER Wolfgang	MedECC
De LATTRE-GASQUET Marie	Centre for International Cooperation in Agricultural Research for Development (CIRAD)
FOSSE Jérémie	ECO-Union, Global Eco Forum
GIER Güzel Yucel	Institute of Marine and Technological Sciences
GRIMES Samir	National School of Marine Sciences and Coastal Planning (ENSSMAL)
GUIOT Joël	MedECC
KRAEMER Andreas	Ecologic Institut gemeinnützige GmbH
LE TELLIER Julien	Coordination Unit MAP
LE VISAGE Christophe	Sea and Coastline strategies
MARKOVIC Marina	PAP/RAC
MENICHETTI Emanuela	OME
PARANT Alain	Mediterranean demographic observatory (Demomed), Futuribles International
PARIENTE DAVID Silvia	Consultant on energy (CMI, World Bank, ...)
RODDIER-QUEFELEC Cécile	European Environment Agency (EEA)
SPILANIS Ioannis	Aegean University, Sustainable Tourism Observatory, Insular Development Laboratory
TSANI Stella	University of Ioannina
UHEL Ronan	European Environment Agency (EEA)

Table 3. List of the permanent members of the MED 2050 Foresight Group

An advisory committee whose role was to ensure that the MED 2050 exercise achieves the objectives set by the Contracting Parties and partners. It is made up of people representing important organisations

in the Mediterranean, working on themes such as the environment, development, and civil society organisations, as well as representatives of the Contracting Parties to the Barcelona Convention. Members of the advisory committee

⁴ The health context during which the first two project phases were conducted made this approach difficult. Many meetings and workshops were held by videoconference.

⁵ See Appendix 1: list of experts supporting the permanent members of the foresight group

also have a role in disseminating the results throughout the Mediterranean Basin. They can serve as relays for dissemination within the Mediterranean sub-regions. They can also identify relay networks within their respective networks as needed. At the end of the exercise, the committee will be able to propose national and thematic extensions to the foresight exercise, as well as transition strategies within countries, so that the transition pathways proposed by MED 2050 are implemented in the most concrete and suitable way possible across the territories.

Table 4.
List of the
Advisory

Members of the Advisory Committee	
Name and surname	Organisation
ADLY Emad	Arab Network for Environment and Development (RAED)
BONNEL Alexis	Agence Française de Développement
CLAUDIUS-PETIT Anne	Région Sud
DE JOUVENEL Hugues	Futuribles International
DOMINATI Laurent	"Save the Mediterranean" Association
ESCODA Anna	Association of Mediterranean Chambers of Commerce and Industry (ASCAME)
EVANGELOU Ellada	Anna Lindh Foundation
GIDRON Tsafir	Plan Bleu Focal Point for Israel
HAMIDI Samira	Plan Bleu Focal Point for Algeria
HEMA Tatjana	PAM Coordination Unit
HUBERT Bernard	Agropolis International
INSALACO Eleonora	Anna Lindh Foundation
KAHIL Taher	International Institute for Applied Systems Analysis (IIASA) (Austria)
KASTRINOS Nikos	European Commission
LEMAITRE CURRI Elen	International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM)
MASSET Philippe	Agency for the Environment and Energy Management (ADEME)
MAURIELLO Valentina	Country representative - Bureau of the Contracting Parties to the Barcelona Convention
MOUFARREH Amal, followed by BOUQARTACHA Farah	Plan Bleu Focal Point for Morocco
MONDIELLI Philippe	Prince Albert II of Monaco Foundation
MOULINE Mohammed Tawfiq	Royal Institute of Strategic Studies (IRES)
NUNES ELodie	Conference of Peripheral Maritime Regions (CPMR)
RODRIGUES Benoit, followed by ELKAÏM David	Plan Bleu Focal Point for France
ROQUE Maria-Angels	European Institute of the Mediterranean (IEMED)
SAMPSON Sonya	World Bank
STOJANOVIC Ivana	Plan Bleu Focal Point for Montenegro
TRUYOL Diana	Association of Mediterranean Chambers of Commerce and Industry (ASCAME)
TUNESI Leonardo	Higher Institute for Environmental Protection and Research (ISPRA Ambiente) and Intergovernmental science and policy platform on biodiversity and ecosystem services (IPBES)

Committee members

The participatory approach has also been applied throughout the programme, with the organisation of workshops especially targeting Mediterranean young people: The Youth Commission for the Future of the Mediterranean, which brought together some forty young people from around the Mediterranean by videoconference (March 2022)⁶, a participatory workshop in the form of a TV show with the participation of young people from the Mediterranean Youth Council as part of the 5th edition of the Mediterranean of the Future in Marseille, France (6 December 2022), and a workshop bringing together thirty young people from the Eastern Mediterranean in Alexandria, Egypt (22 and 23 February 2023). Over fifty interviews with different figures from around the Mediterranean world were also conducted in the second phase of the project⁷. Finally, this participatory dimension was also deployed through participation in events and “focus” projects enabling debate between a wide range of stakeholders, some of which are available on social media:

- a workshop on the “Demographics - International Migration - Sustainable Development” nexus by videoconference (15 and 16 December 2021);
- three workshops as part of the project “Adapting the MED 2050 foresight exercise to the Southern Region”, with elected representatives from the Region (7 April, 4 May and 1 June 2021);
- a workshop on the participatory foresight approach applied to long-term sustainable water management in the Moulouya river basin in Morocco, by videoconference (12 and 13 January 2022);

⁶ Workshop held as part of Module 2: Contrasting visions of the Mediterranean for 2050. See “Part 2: The foresight base”, of this report.

⁷ Idem

- the World Maritime Forum in Bizerte, Tunisia (23, 24 September 2022 and 22,23 September 2023);
- the Mediterranean Forum of the Future in Marseille (5 and 6 December 2022);
- the symposium “The Mediterranean faced with climate shocks: insecurities, conflicts and adaptations” organised by IreMMO-Suds in Marseille (4 November 2023).

Part 2: The foresight base

A large proportion of the MED 2050 exercise was devoted to building a foresight base prior to building the scenarios. This foresight base was structured in three stages: firstly, preparatory work to situate MED 2050 in relation to other comparable studies; secondly, analysis of the Mediterranean system and its development up to 2050 (trends, disruptions, weak signals) with a more detailed exploration of around thirty variables considered to be determining factors; and thirdly, consultation with a number of stakeholders and the general public concerning their visions of the future of the Mediterranean

I. Preparatory work

Plan Bleu carried out several preparatory activities for the MED 2050 exercise. These studies provided useful insight into how the exercise should be designed, and filled gaps in knowledge and resources.

Some of these activities were carried out specifically in preparation for the foresight programme:

- a benchmark analysis of existing foresight studies on the Mediterranean: this document begins by identifying and classifying the relevant foresight studies. It then presents a comparative analysis of the content of these different studies, highlighting the major trends and uncertainties, the driving variables, and the major families of scenarios produced, and makes methodological recommendations. The last step of the analysis discusses the observations made in the previous sections in order to identify the “blind spots” in the existing literature;
- a study comparing predictions made in 2005 with actual situations in 2020. This study had two objectives: compare the predictions of the baseline scenario and the alternative scenario in the 2005 foresight report with actual development of the different variables and phenomena, and answer the following questions: what did the 2005 report correctly or incorrectly forecast, and what reasons explain this gap?
- quantitative exploratory work on long series, with a database including economic, social and environmental variables and statistics dating back to the 1960s. These long data series come from international databases (United Nations, World Bank, etc.). A graphic presentation by country and, when possible, an analysis for each side of the Mediterranean have been produced. This work helped build the foresight base and fed into work on the factsheets.

Other reports or activities have also been used to support reflection for the foresight exercise. This includes:

- the report on the “State of the Environment and Development in the Mediterranean”. This report was created with the collaboration of over one hundred experts and scientists. It highlights a number of pressures that the Mediterranean Basin is currently facing (air pollution, plastic waste in the sea, concentration of populations on the coasts and associated pressures, etc.), which threaten to increase in the next thirty years.
- work by the Regional Observatory on Environment and Development and on sustainability indicators: the MSSD provides a strategic policy framework aimed at securing a sustainable future for the Mediterranean region, in line with the Sustainable Development Goals. A total of 28 indicators (including 24 directly linked to the SDGs) appear on the MSSD dashboard, and a large majority of the MED 2050 factsheets are directly linked to these indicators.

II. The Mediterranean system and its development until 2050: trends, disruptions and driving variables. A summary

1. The Mediterranean system

Before analysing trends and disruptions up to 2050, it is necessary to define the scope considered and its main dimensions, and more broadly the system on which the foresight should focus. This definition of the Mediterranean system was led by the Plan Bleu team from the beginning of the exercise. The discussion was then enriched by consultation within the foresight group on trends and disruptions, and then linked to the DEGEST framework⁸. Equivalent work had already been carried out in previous foresight exercises, and the core part of the proposed “Mediterranean system” remains very similar to the one considered in those exercises. As shown in the figure below, this core system, inspired by the DPSIR model (Driver - Pressure - State - Impact - Response), is based on a looped interaction of six dimensions: (1) demographics, (2) the production-consumption system, and (3) the spatial distribution of activities: have impacts on (4) the environment and resources, particularly marine and coastal resources: which, depending on (5) how they are used and the policies implemented: have (6) more or less positive or negative knock-on effects on development and the population.

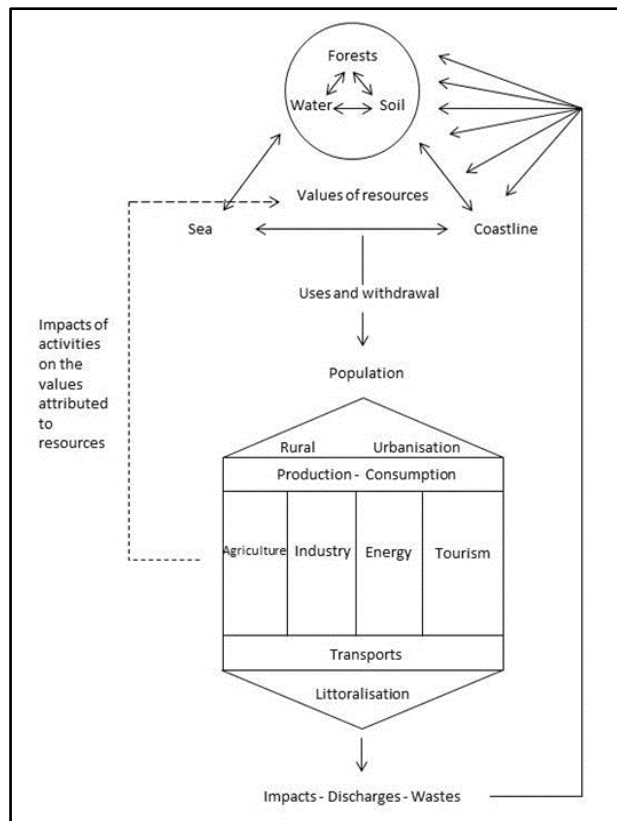


Figure 2. The core of the Mediterranean environment-development system (1989 foresight)

Starting with this basic diagram, it was deemed necessary to add three major dimensions:

- firstly, *the influence of factors external to the Mediterranean*, from global changes such as climate change, to international capital flows, global trade in goods and services, new technologies, extra-Mediterranean migration, geopolitical developments and changes in international governance;
- then *internal changes within Mediterranean societies*: aspirations, social and cultural changes, changes to law and institutions, relationship with nature, education and training;
- and lastly, *issues of security and vulnerability* (energy, food, water, etc.) and *the risks of crisis*, with a specific focus on resilience and adaptation capacities.

Integrating these three dimensions into the initial core produces the following diagram of the Mediterranean system:

⁸ See Section “2. Trends, disruptions and weak signals by 2050”, in this report.

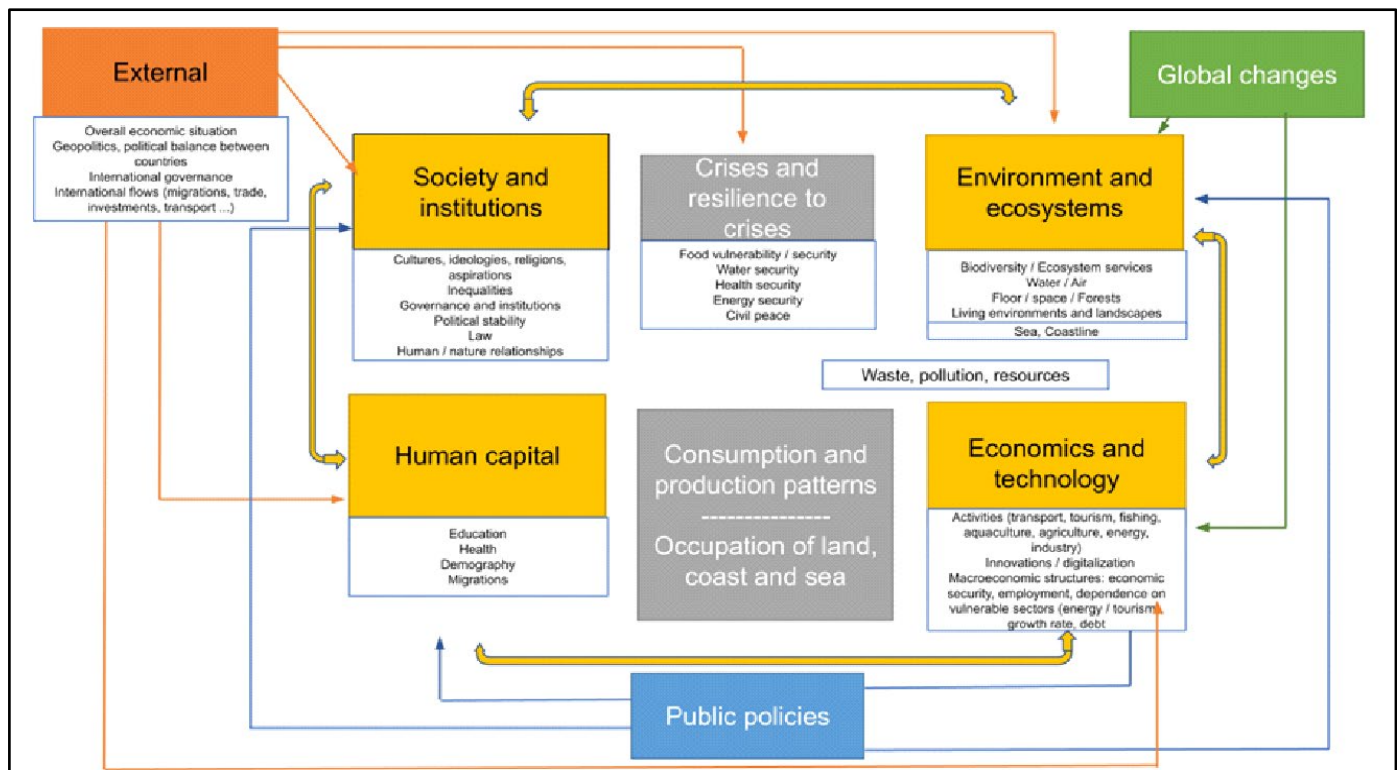


Figure 3. Mediterranean system analysis diagram used in MED 2050

In the first phase, this analysis diagram was used to structure work on trends and disruptions. After this, for building the scenarios, this diagram was combined with the DEGEST structure by adding two dimensions specific to MED 2050 - “the international context” and “regional geopolitics and governance”. These scenarios have therefore been organised around eight macro-variables:

- global context,
- regional geopolitics and governance,
- demographics,
- economy,
- science and technology,
- land and marine environment,
- society,
- and finally, governance and national policies.

2. Trends, disruptions and weak signals by 2050.

On the basis of the systemic framework described above, members of the extended foresight group were asked to list and then rank the trends and disruptions considered to be the most important up to 2050, and identify weak signals indicating significant changes are underway for the future: 195 trends structured around 13 dimensions were mentioned, along with 159 disruptions and 95 weak signals. The results of this consultation were published in the 2022 report on the foresight base⁹. This document will only mention three important components in this first part of foresight exploration: ranking of the trends considered most important by the majority of respondents, a list of major disruptions, and a specific look at weak signals for the environment, including the marine environment.

⁹ See Plan Bleu (2022). MED 2050 Module 1 – The foresight base, preliminary report.

Around twenty trends expected to play a major role over the next thirty years received a strong consensus, and can be grouped into five categories:

- first, those related to climate change and its consequences (sea level warming and rise, droughts, extreme events, etc.);
- next, pressures of all kinds on coastal areas, linked to accelerated urbanisation and poorly controlled activities in these areas, with consequences on the sea, the disappearance of land resources for agriculture, and increasing exposure to climate risks;
- the third category essentially focuses on the economic and social dimensions: globalisation accompanied by a shift in power towards Asia and the GAFAMs, youth unemployment in Southern countries, exponential increase in inequalities, and difficulties in decoupling growth;
- fourth, demographic trends and their impacts on resources, firstly water resources, then soil resources and biodiversity (including the effects of over-fishing);
- and finally, and probably more surprisingly, problems related to a lack of governance: the compartmentalisation of policies into silos, failure to enforce the law, including international law), lack of public policy evaluation and planning, weakness or lack of democracy in institutions.

The following box gives an exhaustive list:

- The global acceleration of climate change: 2.3° increase in the Mediterranean by 2050.
- The concentration of populations and activities in coastal areas and deltas leading to an increase in built-up areas, a loss of agricultural or natural land, and risks of vulnerability.
- The completion of the urban transition, with rampant urbanisation and expansion. Tensions over land use that are increasingly difficult to regulate.
- Accelerated warming of the sea, leading to a change in deep-sea dynamics and a tropicalisation of species.
- A sea level rise of around 50 cm in 2050 with increasing impacts on coastal areas, natural environments, populations and activities. Uncertainties over adaptation policies.
- Continued over-fishing of endangered species despite the massive shift from sea fishing to aquaculture. A general decline in marine biodiversity.
- The critical scarcity of water resources. The majority of Southern and Eastern countries experience extreme water stress, with significant stress in the North. Droughts double.
- Major governance problems (weak democracy or institutions, poor public governance, risks of corruption). An increase in the number of “failed” states.
- Weak law enforcement (for land use, Mediterranean Sea, etc.).
- Poor evaluation and planning tools for public policies.
- A continued general trend for globalisation, with a shift in power towards Asia. The intensification of trade in goods, capital, skills, information and tourism.
- Concentration of capital in the digital economy. The dominant role of the GAFAMs and their Chinese equivalents. The development of artificial intelligence in all areas.
- Increasing economic and political conflicts over access to scarce resources.
- Growing food dependency in the South, especially for cereals.
- Significant rise in inequalities between countries with wealth concentrated in a small minority of them.
- Serious divides that prevent the inclusion of young people in society (employment, education, responsibilities, etc.) as a result of inadequate economic, social or educational strategies.
- Increase in the differences in demographic dynamics between the North (- 10 by 2050) and the South and East (+ 30 to + 45%). 100 million more inhabitants in 2050 in the Southern Mediterranean, and 20 million fewer in the North.
- Population growth in some countries leading to crucial issues related to unsustainable development (shortage of resources, food, environment, jobs).
- Doubling of Africa’s population by 2050 and its increasing integration into the global economy.
- A sharp acceleration in migration (linked to climate, maldevelopment, political conflicts).
- General ageing, with over 30% of the population aged over 60 in the North.
- A slow spread of the circular economy model, and sustainable production and consumption patterns, linked to both ecological and socio-economic issues.
- Energy demand still growing between now and 2050, despite some decoupling.
- Growing yet not always suitable investment from finance sector and international financial or development aid organisations in the ecological and energy transition.

Box 2. Trends considered important with the highest level of consensus

On the other hand, it is important to add that there are strong controversies concerning the direction of possible future developments in many other areas, such as geopolitics, the role of Europe, the growth prospects of the Mediterranean region, changes to certain sectors such as tourism and most sectors in the blue economy, changes to societies or value systems, intra-Mediterranean cooperation, and the continuation of trends towards the fragmentation of the region. These controversies justify the multiplicity of scenarios described in the third part of this report. Following on from this consultation on qualitative trends, as part of a more detailed variable-by-variable analysis (see Section 3. Driving variables and analysis, in this report), it was possible to quantify some major developments up to 2050, particularly in terms of climate, demographics and urbanisation, fisheries and marine biodiversity, availability of water resources and plastic pollution. These figures are summarised in the table below.

Variables	2020	2050
Climate	The second fastest-warming region in the world after the Arctic. In 2020, +1,5°C compared to the pre-industrial period	According to the MedECC scenarios : + 2,2 °C (between +2°C to +2,5°C)

Population	North: 196M / South: 202M / East : 124 M / Total : 522M	Higher hypothesis: North: 200M / South: 315M / East: 174M / Total : 689M Median hypothesis: North: 179M / South : 293M /East : 157M / Total : 630M Lower hypothesis: North: 172M / South: 264M / East: 146M / Total : 582M
	% > 65 years old : North: 21,4% / South: 6,4% / East : 8,06%	Higher hypothesis: North: 35,5% / South: 14% / East : 20% Lower hypothesis: North: 30,5% / South: 11,7% / East : 16,8%
Urban transition (Growth in urbanisation rate)	Several countries from the South and the Balkans (10) keep an important rural population (between 35% to 57%) Urbanisation average rate for the Mediterranean : 72%	All Mediterranean countries have an urban population close or superior to 70%, except Egypt (55%) Urbanisation average rate for the Mediterranean : 82%
Fishing resources and marine biodiversity	Overfishing rate: 75% Fishing industry: 1992 : 1,2 millions tons / 2020 : 0,8 million tons Aquaculture: 2,1 millions tons	Fishing industry: between 1 to 1,2 millions tons Aquaculture: between 3 to 4 millions tons
	The Mediterranean : global biodiversity hot spot (18% of the world's species, 28% of which are endemic) - but highly threatened (8% of species are at risk of extinction)	Very significant qualitative transformation of marine ecosystems: tropicalisation of species with the disparition of certain endogene species (around 20%)
Plastic dumping into the sea	The Mediterranean is the most plastic-polluted marine area in the world: 8 times more than the global average.	An expected 2 to 3 fold increase of plastic dumping into the sea
Risk of water scarcity	180 million people in the South and East are facing shortage of water (less than 1000 m ³ per hab). 80 million in extreme shortage (less than 500 m ³ per hab) 75% of resources in the North.	In 2050, almost the entire population around the basin will be suffering from water shortages due to drought 290 million people in the southern and eastern Mediterranean

Table 5. Some statistical trends for 2050

These forecasts serve as a reminder of four already worrying realities for the Mediterranean:

- after the Arctic, the Mediterranean is the fastest-warming region in the world;
- it is also one of the world's most threatened biodiversity hotspots, with a 75% over-exploitation rate for fished species and a drop in fishing catches between 1992 and 2020 from 1.2 million tonnes to 800,000 tonnes;
- the Mediterranean Sea is the most plastic-polluted sea in the world,
- and finally, more than 55% of the population in the South and East already suffer from water shortages (less than 1000 m³ per capita).

With climate change already foreseeable, and a population set to increase by 140 million in the South and East, concentrated in cities and coastal areas, this situation is unfortunately likely to deteriorate further by 2050. This is undoubtedly the main trend, which largely encompasses all others, and justifies the need for positive shifts or disruptions to move towards more sustainable development and the active prevention of major risks.

b) A world of turbulence: possible disruptions at all levels and in almost every field

The list of disruptions mentioned by the experts is almost as long as the list of trends, and addresses all areas (economy, technologies, environment, geopolitics, societies, governance). The general conviction is that the next thirty years will be marked by multiple and major turbulences and shifts. The disruptions on which there is a broad consensus, which are considered highly likely, once again concern climate change:

- Climate change accelerates much faster than predicted (tipping points are passed), with multiple consequences;
- much more rapid expansion of deserts and periods of drought;
- the possibility of periods of "migratory chaos" and social or economic disruptions linked to the mass influx of displaced persons due to climate change;

- sudden acceleration of the rural exodus to cities and the coast;
- the first impacts of rising sea levels and the disruption of major ocean currents;
- the major transformation of the Mediterranean marine ecosystem linked to the climate, especially with disruptions in the regulation of the upper and lower layers and currents of the Mediterranean.

In addition to this list of disruptions linked to climate change, there are also a number of possible but not necessarily probable shifts, particularly in the economic and social spheres:

- establishment of a common space for sharing patents and technologies between the North and South Mediterranean;
- a sudden and regionalised de-globalisation of maritime flows (end of hubs and re-regionalisation of traffic, cabotage, etc.) and strong development of intra-Mediterranean trade;
- internal revolts or mass migration due to the despair of young people;
- faster development of civil societies, including in the South, giving them an important role in public decision-making;
- reconstruction plans for disaster-stricken countries or a “Marshall Plan” for Africa and the Southern and Eastern Mediterranean.

Beyond this consensus, taking into account not only the experts in the foresight group, but also consultations held with a number of key figures in the Mediterranean region, and detailed analyses of the different variables in the Mediterranean system¹⁰, provides a much longer list of potential disruptions, including political and geopolitical shifts. This is summarised in the following box:

¹⁰ See Appendix 2: List of variables studied as part of MED 2050.

- A Mediterranean common market
- A Union of Maghreb countries
- An Arab revival (Union of Arab States)
- Weakening of radicalism and religious conflict
- An axis of vertical integration between Europe - the Mediterranean - Africa
- An axis between China - Middle East - Southern and Eastern Mediterranean
- A (democratically elected) Mediterranean Parliamentary Assembly with a President
- Opening of the North-East corridor for freight
- Tropicalisation of the Mediterranean Sea. A transformation of ecosystems
- Progressive cadastralisation of the Mediterranean Sea
- Ban on deep-sea mining
- The Mediterranean Sea becomes a global commons
- Creation of an IPBES equivalent for the Mediterranean Sea
- Strict legal enforcement of the Barcelona Convention
- Dramatically accelerating climate change (tipping points)
- Mass relocation of workplaces and living spaces due to digital technology (remote working)
- A change in values and behaviour linked to climate change and the growing concern of young people: the arrival of a new generation of leaders.
- A Mediterranean solar union
- A worldwide extension of the European ban on the sale of new internal combustion engine vehicles from 2035.
- A “Marshall Plan” for adaptation and water for Southern countries, financed by taxes, especially on financial transactions (€400 billion per year)
- A sharp rise in mobility costs (carbon tax, air travel peak, new energies, etc.)
- A decisive disruptive technology for desalination (ecological and economic)

Box 3. Some major disruptions by 2050

c) Weak signals of change: examples from the environmental sector.

Consensus on trends or disruptions does not give us precise information on their probability. It is therefore useful to supplement them with so-called “weak signals”. These are observations of embryonic changes believed to have a major influence on future development trajectories. The foresight group worked together to detect around one hundred of these weak signals spread across six major areas: geopolitics, the environment and climate, demographics and the distribution of activities across regions, the knowledge society, the economy, and social and political change. The following list presents the weak signals mentioned for the environment, in particular the marine environment. Some are linked to the events of 2020 - 2021. Others reflect more subjective perceptions.

- Strong development of offshore projects (gas, aquaculture, pipelines, real estate, artificial ports, wind farms, etc.).
- Initiation of strategies for deep sea mining and increase in the number of mining permits, within a context of international trade.
- Installation of first offshore wind farms (Italy, Morocco, etc.).
- Local opposition to over-tourism and large cruise ships.
- Repeated and increased severity of drought episodes and major fires.
- Major solar projects in some Arab countries (Morocco, Gulf States, etc.).
- Increase in soil salinity, particularly in all the deltas (Ebro, Rhone, Po, Nile, etc.).
- Change in the primary composition of the sea: phytoplankton, microalgae, etc.
- Development of invasive species, jellyfish and algae.
- Introduction of first programmes to reduce plastics in the Mediterranean and worldwide by 2030.
- Acceleration of sea water desalination projects.
- First serious measures to reduce air pollution from ships (sulphur, CO₂, 40% reduction in carbon intensity between 2008 and 2030 (IMO)).
- Attempts to regulate the use of pesticides, antibiotics, endocrine disruptors, fertilizers, etc. and difficulty in reducing them.
- “Case of the century” and legal actions against states failing to follow through on their international climate commitments. Pressure for the recognition of the concept of ecocide.
- Recognition of the rights of some natural areas (rivers, etc.).
- Implementation of the European Green Deal, greening of the CAP and impacts on the Mediterranean region. A ban on the sale of new fossil-fuelled cars in 2035.
- Development of sustainable finance (EIB, EU, WB, etc.).
- Increasing treatment of water as a commodity (creation of a market for water in the event of crises and serious shortages).
- Development of electric or non-motorised land and sea transport solutions.
- Since 2021, global investments in renewable energies that have exceeded investments in fossil fuels.
- Experimentation with alternative solutions in agriculture (agroecology, agroforestry, permaculture, etc.).
- Development of “conservative” agriculture and agroforestry.
- Ecology associated with privileged urban social categories in the North: short supply chains, organic products, sobriety, alternative mobility, veganism, low-tech, etc.
- Successful experiments and innovations in the blue economy (cleaner ships, sustainable fisheries, aquaculture, etc.).
- Focus on environment-health and environment-biodiversity relationships (post Covid). “One Health” approach.
- Very slow emergence of the circular economy and questioning of waste exports.
- Widespread crisis of municipal waste management in large cities around the Mediterranean.
- Slow progress in raising environmental awareness in the South. Role of civil societies.
- With the risk of sea level rise and increased severity of extreme weather events, some decision-makers (town by town) shift from a coastal protection strategy (dykes) to a strategy of progressive strategic withdrawal.

Box 4. Weak signals mentioned by experts for the environment, climate and sea

3. Driving variables and analysis

Work on both system analysis and trends, disruptions and weak signals identified a number of driving variables. These were used to draw up a thematic inventory of the region’s main problems in 2020, and to make assumptions about how they will evolve by 2050. These “structuring variables” (or system components) were grouped into major dimensions (following the DEGEST structure), before being transformed into the factsheets. There are 36 factsheets whose themes were chosen collectively by the foresight group¹¹.

CONTEXT

¹¹ See Appendix 2, for the detailed titles of the factsheets.

- . Global trends
- . Major global trends and their impact on the Mediterranean
- . Global climate change scenarios
- DEMOGRAPHICS AND REGIONAL PLANNING**
 - . Population growth
 - . Migration dynamics
 - . Urban transition
- ENVIRONMENT**
 - . Human activities in coastal and maritime areas
 - . Climate change and its effects on land and marine ecosystems
 - . Biodiversity and marine ecosystems
 - . Land resources and biodiversity
 - . The link between water, soil, agriculture and the environment
 - . Water resource management
- ECONOMY**
 - . Public and private financing for development
 - . Exploitation of marine mineral and energy resources
 - . Fisheries and aquaculture
 - . Economic growth and the economy-environment trade-off
 - . Blue economy
 - . Maritime transport
 - . Tourism
 - . Inequalities, poverty and social mobility
 - . Production and consumption patterns
- SOCIETY**
 - . Mediterranean identities
 - . Value systems and religiosities
 - . Young people in society
 - . Status of women
 - . Environmental awareness
- GOVERNANCE**
 - 1) Regional governance**
 - . Geopolitics and security
 - . The Mediterranean in European policies - Green Deal
 - . Governance of the marine environment
 - . Multi-scale, multi-stakeholder governance
 - . Policy coherence and regional cooperation
 - 2) National or local governance**
 - . Adaptation and mitigation policies
 - . Energy transition policies
 - . The role of civil society in public policy
 - . Risks and crisis prevention
- SCIENCE AND TECHNOLOGY**
 - . Knowledge-based society
 - . Observation, surveillance and warning systems

Box 5. Driving variables grouped by major dimensions (extended DEGEST)

The factsheets follow a common framework structured into 5 sub-sections:

- definition of the variable and description of its scope. This first stage is vital as it identifies the themes to be addressed and the angle of attack favoured by the author(s);
- a retrospective analysis of past trends for the variable, based on (quantitative or qualitative) data available in the scientific literature. Drawing on this objective basis, the authors can then propose the trends and disruptions that will structure foresight;
- an assessment and ranking of the issues associated with each theme (risks and threats to avoid, obstacles to overcome, objectives to achieve). Some issues may overlap with the sustainable development goals;
- assumptions about trends up to 2050: major trends and disruptions for the variable, with an assessment of plausibility;
- and, finally, proposed scenarios for the same timeframe (between three and five scenarios).

A summary of these factsheets is available in the report published in 2022 on the “foresight base”, and these factsheets will be available on the project website¹².

This work was used to build the two morphological charts on which the scenarios are based. The first cross-references the thirty or so driving variables grouped according to the extended DEGEST structure (in eight dimensions) with the assumptions of the proposed scenarios in each factsheet (see simplified version of the morphological chart in Part 3, page xxx and the simplified version in the Appendix). The second structures the variables into three main categories: context variables, cross-cutting variables and sector variables. These tables are essential because they constitute the link between the foresight base and the six scenarios described in Part III.

¹² See the project website: www.med2050.org

III. Contrasting visions of the Mediterranean by 2050. A summary.

In addition to the work of the experts in the foresight group, and in line with the MED 2050 roadmap, which highlights the importance of incorporating a participatory dimension into the foresight exercise, consultation was carried out to determine the visions of stakeholders on the future of the Mediterranean. The main characteristics of this approach are based on the desire to take into account the heterogeneity of the Mediterranean sub-regions and a diversity of stakeholders (from civil society and the worlds of politics, science, academia, economics or “business” and the arts), within an overarching foresight approach for the region. Given the health context in which this module was implemented, two avenues were chosen: a survey of around fifty individuals representing all countries around the Mediterranean, and a workshop bringing together around forty Mediterranean young people aged between 17 and 27, with different profiles, entitled the “Youth Commission on the Future of the Mediterranean”.¹³

1. Survey of Mediterranean individuals

A study of the interviews conducted revealed the same general observation: Mediterranean societies are in crisis, with generally converging views on environmental degradation, social and political tensions, and growing inequalities, particularly between the Northern and Southern shores of the Mediterranean. These are therefore predominantly pessimistic visions, based on the observation of major disruptions currently affecting the region: the impact of climate change, with an emphasis on the idea of exceeding “tipping points”, sometimes even evoking apocalyptic visions such as the disappearance of cities or islands as the sea rises; pollution, with frequent mention of plastic pollution; the unsustainable use of resources, with particular emphasis on the erosion of biodiversity and the depletion of water resources; and issues linked to marine ecosystems given the intensity of maritime traffic, over-fishing, illegal fishing and mass tourism. In addition to this gloomy picture for the environment, there are social and political concerns linked to intense demographic growth, placing additional pressure on coastal areas and leading to the uncontrolled development of many Mediterranean cities; migration as a major issue resulting from other challenges (geopolitical, environmental, etc.); the place of the Mediterranean in the global political landscape and the risks linked to competition, or even conflict, between the major political and military blocs, with the fear expressed by some respondents that the ambitions of some states could lead to the fragmentation of the region.

Faced with this observation, many respondents unanimously expressed their rejection of the status quo and inertia foreshadowed in the business-as-usual scenario. This would require considering the region as a commons by looking at the issues over the long term, and moving away from isolated thinking to adopt a more holistic approach to the challenges facing the Mediterranean. It is about revolutionising thinking, and working to build a collective imagination that encourages people to adopt actions commensurate with the issues and challenges at stake.

While the notion of crises is omnipresent in almost all the interviews, for some people, they are far from representing only threats, but are synonymous with hope, and their cathartic effects are sources of opportunities to invent new models. The Mediterranean is not only perceived as a region with an accumulation of difficulties and obstacles. On the contrary, it could prove to be inspiring and form a laboratory of solutions, and for some, even an innovative development model that could inspire other regions of the world. These changes would come from the younger generations, on the fringes of institutions. Some highlighted the lack of convincing results or even failure of these institutions. However, this means responding urgently to the brain drain, which is identified as a fundamental problem by some interviewees from the Southern and Eastern Mediterranean, and investing in human capital, starting with education and training.

Although the Mediterranean is a space of “otherness” with multiple identities, it has an essential asset based on a melting pot and common heritage. Many of those interviewed call for greater regional integration based on cooperation and solidarity, investing more in this foundation of shared fundamental values and complementarity between the different shores of the Mediterranean, rather than in rivalries and differences. A political framework capable of organising this has not yet been invented, as existing models have shown their limitations. Some mentioned very concrete examples such as

¹³ For more information about the survey for individuals from the Mediterranean and the workshop “Youth Commission on the Future of the Mediterranean”, see the preliminary report for MED 2050 Module 2: Contrasting visions of the Mediterranean for 2050.”

a (democratically elected) Mediterranean Assembly with a President, and greater integration of citizens in decision-making processes, particularly in local governance. A community with a shared destiny, with the Mediterranean as a commons - “One Mediterranean” - as others note that in an increasingly interdependent Mediterranean and even world, crises teach us that only a collective framework makes sense. This would mean reforming legal systems, and therefore rewriting some laws to set a precedent, in order to take account of common assets, including the Mediterranean Sea.

Despite unanimous acknowledgement of the crises in the Mediterranean, there are nonetheless points of divergence on the solutions to respond:

- the democratic model based on a liberal economy raises questions about its suitability for some countries, particularly in the South and East;
- the driving and positive role of the European Union, particularly within the framework of a strong, balanced and continuous Euro-Mediterranean partnership (with a vertical axis integrating Africa according to several respondents), is subject to debate, with reservations from individuals from the Southern and Eastern shores, especially linked to the Palestinian issue and the notion of meddling;
- the market economy, which does not benefit some Mediterranean countries with fragile economic situations and large debts;
- mass (or popular) tourism, which some see as a threat, while others see it as a source of opportunities, if properly managed and regulated;
- the role of technology in solving a number of problems (e.g. desalination of sea water or decarbonisation of the energy sector);
- the type of energy, with the use or non-use of certain forms of energy such as nuclear or offshore wind power;
- lifestyles and the depth of the changes required, and above all, who should bear this responsibility: consumers versus producers.

Finally, in these interviews with Mediterranean figures, the rural world or rurality was mentioned only once, apart from in comments related to agriculture and food security, but not as a subject in itself. This “omission” could be explained by a decisive trend underway for 2050, with an urban transition set to hit all Mediterranean countries. It is estimated that all Mediterranean countries will have an urban population around 70% or more (except Egypt at 55%), with an average urbanisation rate in the Mediterranean of 82%.

2. Youth Commission on the Future of the Mediterranean

To provide a framework for the 4-hour workshop, two lines of thought were chosen:

- the lifestyles, closer to the daily reality of individuals (activities such as eating, mobility, work, etc.),
- the role and place of societal actors, starting with public institutions, states, local authorities, businesses, the media and organised civil society.

To encourage the emergence of contrasting visions of Mediterranean societies in 2050, a procedure structured around three dynamics was developed:

- Providing young people with fictions before and at the start of the workshop, as the human mind projects itself more easily into stories (books, TV, films, etc.);
- Getting young people to work on the societies in which they would ideally like to live;
- Asking young people not to project themselves within the fictions as individuals, but to think about the dominant lifestyles at work in these scenarios.

Analysis of discussions during the workshop can be summarised in the following points:

- A rather dystopian vision of the future: overall, participants found dystopias more likely than utopias. This is because they feel that dystopias are in continuity with our current lifestyles (Fiction 2) or with the directions taken by governments today (Fiction 1). This explains why the advent of a major crisis is also considered credible (Fiction 3).

- Consensus on nature-based solutions: organic, seasonal and less meat-based food, urban greening, the use of nature-based solutions to achieve carbon neutrality, and even walking and cycling, are all favoured by a large majority of respondents.
- Questioning technologies: technologies are widely accepted and expected in the fields of health, education and work, or in response to major crises (such as water desalination in the event of drinking water shortages). However, their use to monitor and control household carbon consumption, create artificial rainfall or for carbon storage appeals to some respondents but disgusts others. The latter believe that it is essential to favour natural solutions where they exist, and to develop technologies if, and only if, they have little or no negative impact on ecosystems.
- Disagreement surrounding the creation of metropolises: while land artificialisation, particularly in rural areas, is criticised, participants pointed out that access to employment is essential in cities. The creation of metropolises is both desired and rejected (*"my heart goes both ways"*). Participants paid particular attention to coastal preservation, which is a sensitive issue for most of them.
- Sobriety: opponents and *aficionados*: sobriety, in the sense of reducing consumption, generates both positive and negative perceptions. For most participants, sobriety could only become a dominant practice in Mediterranean societies if it is forced (regulations or crises).
- High expectations for social justice: all the inequalities portrayed in the fictions were condemned by the participants, who also identified other risks to people (such as the abuse of night work, modern slavery for climate refugees, and pandemics). Participants expect governments to be attentive to the issue of equality and to put forward appropriate solutions. However, not everyone is prepared to work individually to help others (e.g. in communities or through work centred on collective needs).
- Environmental awareness at the heart of stakeholders' actions: governments are expected to raise public awareness about the environment and force businesses to make the transition. On the flip side, citizens are expected to put pressure on governments alongside NGOs. The media, non-profits and local authorities have been identified to help individuals change their lifestyles (towards greater sobriety). In particular, local authorities are seen as guardians of the interests of local communities, with the correlative responsibility for creating projects with citizens, especially women and young people.
- International cooperation under certain conditions: while international cooperation between all Mediterranean countries is hailed as essential (Fiction 1), it is seen as unlikely, especially by people living in southern countries. A number of conditions need to be met, including the redistribution of wealth and consideration of Mediterranean lifestyles, in order to adopt a sustainable approach collectively.
- Persistent contrasts between the southern, eastern and northern Mediterranean: people living in southern Mediterranean countries seem to be seeking emancipation (action without waiting for help from northern countries). Those living in the eastern Mediterranean seem to expect more protection for individuals in the face of the most restrictive situations. Those who live in the North expressed a greater sense of urgency to take action to tackle climate change and the loss of biodiversity. A larger sample would be needed to verify these positions.

- Young people eager for more discussion: participants in the Youth Commission on the Future of the Mediterranean asked for the opportunity to repeat these discussions, debate substantive issues and work together to build a common future for the Mediterranean region. These are innovative and hopeful perspectives

3. Overview of visions for the Mediterranean by 2050 - what are the results?

The views expressed in the “personalities” interviews and the Youth Commission on the Future of the Mediterranean are generally pessimistic about the likelihood of Mediterranean countries making the political and economic changes needed to reverse current trends, which are deemed disastrous for the environment and society. Several participants referred to the idea that humans only change once they are up against the wall, and that only a major crisis can force systemic change. Even though the “business as usual” scenario is considered the most likely, the status quo is unanimously regarded as unacceptable.

Across generations and across all the Mediterranean countries represented in these surveys, there is consensus about a desire for profound change, and a refusal to accept inaction, as this is considered irresponsible. Points of agreement and consensus can be found on subjects such as stopping the use of fossil fuels, inequalities within countries and between the different sides of the Mediterranean, and mass land artificialisation, particularly in coastal areas. The majority of those surveyed call for more sustained international cooperation, which many see as a *sine qua non* for a successful transition to a desirable future. However, this unanimity is somewhat tempered: young people in the southern Mediterranean are sceptical about getting help from affluent northern Mediterranean countries, and tend to favour endogenous solutions without waiting for outside help. While all those interviewed said they would like to see closer cooperation, young people from the southern Mediterranean expressed a desire for autonomy, and a certain distrust of the North. This scepticism echoes a concern shared by personalities from the southern Mediterranean, almost all of whom said that the prerequisite for North/South cooperation was the need to resolve the political disputes currently aggravating relations between the two sides (in particular, colonial legacies and the Israeli-Palestinian conflict).

Overall, respondents were in favour of greater public sector control over the private sector, greater pressure on governments from NGOs and the media, respect for nature, the promotion of nature-based solutions, the preservation of coastal areas, greater power for local authorities and the development of medium-sized cities and towns.

Several of the personalities interviewed expressed both their desire to make way for new generations, and their confidence in young people’s ability to bring about the necessary turnaround in values and lifestyles. Rather than blind faith in the new generations, these responses are probably also a sign of awareness of the failure of the older generations to provide solutions for a more viable future in the Mediterranean.

The Youth Commission on the Future of the Mediterranean shows, however, that the way in which new generations view the future of the Mediterranean varies enormously, particularly depending on their country of origin. While there is a shared desire for change, there were different concerns and contrasting, even diverging, ideas about what needs to be done to change the trajectory.

A strong divide was seen concerning the use of technology and a change to lifestyles. There were two opposing positions: “technophiles” who want to maintain current lifestyles, and “downshifters” who want to shift towards greater sobriety by radically transforming the way society is organised, and our consumption and production patterns for greater equity. While the use of technology to reduce greenhouse gas emissions or respond to crises is universally accepted, geo-engineering (such as techniques to induce artificial rainfall) and enclosed tourism solutions under glass are widely debated. It seems that these two typical positions are geographically divided, with respondents from eastern Mediterranean countries tending to be more technologically-oriented and liberal, while those from northern countries tend to desire a return to more sustainable, environmentally-friendly lifestyles. Like the views expressed on cooperation, it should be noted that this geographical divide on technological solutionism was also found in the Personalities’ interviews.

Beyond consensus on the desire for profound change and improved international cooperation, lines of dissension were seen not so much based on the age of those surveyed, but mainly based on their geographical location. Beyond any divisions or differences of opinion or choice, there is a sincere desire on all sides to maintain dialogue, and better still, to carefully cultivate it, as each side expressed their deep rejection of selfishness as the worst kind of behaviour, be it personal, communitarian or national. It is considered a vector of certain catastrophe.

Part 3: The scenarios

The scenarios were built on the basis of the results from analysis of the foresight base, in particular the micro-scenarios developed for each variable making up the Mediterranean system, and on the visions gathered during the Youth Commission on the Future of the Mediterranean, and interviews with Mediterranean figures. This upstream work has been summarised in a morphological chart presenting all the assumptions for each variable analysing the Mediterranean system up to 2050. This morphological chart was essential for building the scenarios and served as a basis for the work carried out during a workshop on the development of the scenario outlines, by cross-referencing the assumptions of each variable, using two methods, as explained in a chapter on the approach.

The Plan Bleu team wrote the scenarios based on these scenario outlines. This work was a long process, which included many presentations of the scenarios to different audiences, in order to test them and make them stronger and more credible. Each scenario was drafted using the same template, which is broken down into four sections: first an abstract, then a presentation of the dynamics and actors, followed by a description of the scenario, and finally a last section for assessment of the plausibility of the scenario.

This section on the scenarios concludes with an overall assessment of the scenarios. This analysis is summarised in a summary table comparing the scenarios according to various criteria: initial global context, triggers, drivers of change, actors, levers, sea, opportunities and benefits, risks and weaknesses, analysis logic, and plausibility.

I. Building the scenarios

1. Presentation of the approach

The scenarios were developed at a workshop held in Montpellier from 30 May to 1 June 2022, with around twenty participants, including members of the MED 2050 steering committee and foresight group. The aim of this workshop was to draw up the outlines of the scenarios. Two methods¹⁴ were used to sketch out the outlines, drawing on the same frame of reference which is the thirty-six variables and their development assumptions, summarised in a morphological chart, of which the following extract provides an illustration (the complete morphological chart is presented in the Appendix 3)¹⁵.

¹⁴ Please note that these two approaches are part of the overall “scenarios” method in the classification proposed by Bishop *et al* in 2007 (Bishop P., A. Hines and T. Collins, 2007, The current state of scenario development: an overview. Foresight Vol 9-1; 5-25).

¹⁵ For more details, please refer to Appendix 3: Morphological chart

Variables	Hypothesis 1	Hypothesis 2	Hypothesis 3	Hypothesis 4	Hypothesis 5
Major global trends for 2050	Sino-American diarchy	"Open World 4.0"	A world of fortresses	A multi-polar world	Global mobilisation for sustainable development
The Mediterranean in the global context	Status quo and "Battlefield": National isolationism and stagnation	Crises, profound destabilisation and resilience	Recomposition of the Mediterranean space into large "centrifugal" sub-regions	Successful adaptation to globalisation (technological and ecological)	Co-construction of a (sustainable) development model specific to the diversity of the Mediterranean
Global climate scenarios (IPCC)	Target rise of 1.5°C by 2100 (2°C by 2050 in the Mediterranean)	Carbon neutrality in 2050 (+2°C by 2100) (2°C by 2050 in the Mediterranean)	Business-as-usual: +3°C to +3.5°C by 2100 (2.3°C by 2050 in the Mediterranean)	Climate chaos: tipping points exceeded (2.8°C by 2050 in the Mediterranean)	Successful climate engineering and maximum efficiency of carbon sinks
Adaptation issues and policies, between vulnerability and resilience	Public awareness raising and development of a risk culture	Economic regulation through insurance and international aid (from North to South). Public compensation for damage	Decentralised management of adaptation by territories and land-use planning and resilience policies	Investment policies (dykes, etc.) targeting the most vulnerable areas, populations and infrastructure	Anticipating the impacts of climate change on activities and ecosystems, and active transition strategies
Transformations of the Mediterranean ecosystem and impact on marine and coastal biodiversity	Marine ecosystems undergo structural transformation (massive disruptions linked to climate change, tropicalisation, etc.)	Biodiversity and marine ecosystems under pressure. Protection limited to Marine Protected Areas and emblematic species	Species replacement and new ecosystems (very contrasting trends: depending on the species and sub-regions)	Successful ecological transition, strong protection of marine biodiversity and control of catchment areas	Diversification and enrichment of ecosystems, resulting in increased overall productivity

Table 6. Extract from the morphological chart for illustration

This table was structured in two different ways for the needs of the two groups, each using a different approach: (1) the method of building scenarios by morphological analysis (DEGEST framework), and (2) a method combining a hierarchy of driving variables and the "backcasting" approach.

Each method mobilised a specific working group over a day and a half, in two parallel workshops. The first group drew up five basic outlines of scenarios and the second group produced six. A plenary session then brought together all the experts to share the results and merge the scenarios produced in the workshops.

2. First approach: building scenarios using morphological analysis

Following this approach, building robust, plausible and contrasting scenarios for the futures of the Mediterranean basin is part of an approach that uses the classic scenario-based method¹⁶ at its core, with a system analysis framework derived from the DEGEST approach.¹⁷

¹⁶ Godet, M., & Durance, P. (2011). Strategic foresight for corporate and regional development

¹⁷ Cornish, E. (2004). Futuring: The exploration of the future. World Future Society

Component 1, the context, has four variables: major trends on a global scale, the place of the Mediterranean in the world and in European policies, and finally the IPCC climate scenarios. As presented in the system analysis, the importance given to the global and European context outside the Mediterranean is a specific feature of MED 2050 compared with previous foresight studies.

Component 2, demographics, has two classic variables: demographic trends and migration dynamics, both of which are central to the region's development.

Component 3, the environment, has six variables that distinguish between the sources of change, such as the concentration of human activity on the coast, and the ecosystems, environments and resources affected by these changes. This component is important because IPCC projections show that the Mediterranean region is ahead of the global average for climate change.

Component 4, governance, has eleven variables. This high number is explained by the multiple influencing factors in this field: geopolitics; security; relations between EU and non-EU countries; energy, carbon emissions management and risk prevention policies; the level of involvement of civil society, coastal zone planning, etc. Within this set, it is important to distinguish between regional governance and geopolitics (which concerns the region as a whole and is closely linked to the global or European context) and governance within countries.

Component 5, the economy, has nine variables. It encompasses all levels, from financing of investments and the necessary transformations, to consumption patterns and changes to inequalities between social classes and between sub-regions. Several variables focus on major sectors in this region, such as tourism, transport, fisheries and aquaculture, and more generally, the potential of the blue economy.

Component 6, societies, has six variables and deals with various aspects such as the place of young people and women in community life, the burden of senior citizens, the influence of secular and religious value systems on human relationships and social choices. The specific role of the media, including the Internet and technological developments, is also taken into account.

Component 7, technology and science (two variables), focuses on research innovation policies in the Mediterranean and on observation systems in all areas, which are essential knowledge tools for understanding dynamics.

Box 6. The seven components of the DEGEST framework

The working group completed this morphological analysis in two stages: a first stage of aggregating assumptions related to the variables for each component of the DEGEST framework, and a second stage of integrating the micro-scenarios obtained for each component at the overarching level. It is worth noting that this shared collective vision of all the micro-scenarios by the whole group facilitates the development and balance of scenarios. The group worked on the components in order of importance: Governance, Context, Societies, Demographics, Economy, Environment and then Technology. Each variable was also ranked in order of importance, i.e. in the order in which the group considered that any changes would have the greatest impact on the component considered. Another methodological precaution was taken. The moderator for building scenarios was changed for each new scenario, in order to avoid a potential bias in the way the exercise was conducted by a single person. Subsequently, once all the variables in the morphological chart were included in the micro-scenarios proposed for the various components, these combinations could be analysed and tested in an overall morphological chart to build the final scenarios. In the end, five scenarios were obtained by morphological analysis using the DEGEST framework:

- Scenario 1 - BAU - Metastable and asthenic
- Scenario 2 - Perfect storm
- Scenario 3 - Pragmatism still trumps engagement
- Scenario 4 - State-community alliance to restore common goods
- Scenario 5 - A responsible, learning society

3. Second approach: exploration of possible scenarios based on a ranking of driving variables and a backcasting approach.

Whereas the first approach starts with all the variables with their corresponding development assumptions, and integrates them in two successive stages (within each DEGEST dimension, then considering them all together), the second approach starts by ranking the variables and key shifts that will determine the future of the Mediterranean. Through successive adjustments, it then endeavours to re-connect these essential components and scenario ideas with the assumptions relating to all the other variables (backcasting approach). To use an architectural metaphor, this second approach begins by defining specifications, then choosing the architectural design and building pillars, before ensuring that it can be built using the available materials (the assumptions for all variables). The process followed in this second workshop involved six stages:

- Firstly, a reminder of the specifications of the MED 2050 project: to build robust scenarios that are useful for decision-making, covering the diversity of possible developments between now and 2050; to give an important place to the sea and the climate; to address the interfaces between the environment and development; to analyse the conditions for cooperation between countries and territories in the region, taking into account developments inside and outside the region; and finally, to consider the major risks of disruption or crisis over the next three decades;
- After this, the participants were provided with and collectively read a detailed morphological chart differentiating between context variables (2), cross-cutting variables (14) and sector variables (20);
- The third essential stage included the ranking of context and cross-cutting variables to identify ones that are key for structuring the scenarios. At this stage, an initial distinction was made between variables that will be key in determining the future development of the Mediterranean, but which are characterised by a high degree of inertia, and those that are much more unstable and uncertain. Demographic trends, the urban transition, the influence of digital technology, and climate change fall into this first category, despite possible variants, and their consequences must be reflected in all the scenarios. On the other hand, other cross-cutting or context variables are more unstable or uncertain, and may therefore be used to substantiate different scenarios: changes in the external context, growth and development choices, regional or internal governance within countries, cultural and societal changes, and the priority given to the environment. After discussion, it emerged that the international and European context, modes of governance and intra-regional cooperation or cooperation within countries and territories, and development choices were essential for differentiating the scenarios.
- In the fourth stage, debate shifted from the driving variables to the disruptions and shifts likely to have a decisive impact on the future of the Mediterranean. Around ten of these were mentioned by group participants:
 - a common market for the Mediterranean
 - true enforcement of the Barcelona Convention
 - a Union of Maghreb countries
 - a vertical axis (Europe - Mediterranean - Africa)
 - the Mediterranean Sea as a global commons
 - shocks, especially climate shocks, that cause a change in values and behaviour, particularly among young people
 - an Arab “revival”
 - changes in the location of work
 - a space for information and governance
 - a Mediterranean alliance for solar energy and hydrogen
 - weakened religious radicalism

- a Marshall Plan for Africa and Southern and Eastern Mediterranean countries

Following this debate on the major shifts, it was decided to adopt a scenario based on the Mediterranean Sea as a global commons. The list of disruptions mentioned also showed the importance of the political dimension at all levels (from global to local), socio-cultural changes and the risk of faster-than-expected climate change.

On the basis of these first four stages, it was possible to tackle the fifth crucial stage of choosing the scenario ideas. Initially, it became clear that two issues were essential: one about the Mediterranean as a global commons (see previous paragraph), and the other on the prospect of a serious crisis in the region. For the rest, it seemed that the choice of other possible scenarios should consider a small number of essential criteria: the speed and intensity of future changes (inertia, slow transformation, radical disruption); the integration of the Mediterranean into globalisation (marginalisation, autonomy, integration); the forms of cooperation between countries (conflicts, fragmentation, North-South cooperation, South-South cooperation); development choices and the role of the environment (growth at any cost, weak or strong sustainability); and lastly, modes of governance in relation to socio-cultural changes (effectiveness of governance, role of nation states and civil or local societies, political room for manoeuvre). After discussion, the group reached a consensus on six scenarios:

- Scenario 1 - Mediterranean: battlefield and marginalised
- Scenario 2 - Colliding crises and shifts
- Scenario 3 - Structural change in a plural Mediterranean
- Scenario 4 - Euro-Mediterranean Deal for an ecological transition
- Scenario 5 - A specifically Mediterranean model of sustainable development
- Scenario 6 - The Mediterranean Sea: global commons

A final very time-consuming stage involved taking each scenario and reconstructing the list of corresponding assumptions for each of the 34 variables considered, and ensuring the consistency of this list. This backcasting approach starts with an objective and then specifies the conditions for achieving it. It showed that the group's proposals adequately covered the entire morphological chart originally proposed.

4. The results: six scenarios for the Mediterranean by 2050

In order to establish definitive scenarios common to both groups, a third and final stage was required. The two working groups pooled their results, placing the eleven scenarios produced in parallel working sessions in a single table. Then, in successive iterations, the plenary group looked for identical scenarios in order to merge them, while generally enriching the scenario from the two different sources. The group went back to the variables chosen to ensure that the merged scenarios had the same "roots". The group then studied the remaining scenarios, with two options:

- either the scenario studied was too original to be cross-referenced with another and too important to be eliminated from the final selection; in which case it was retained as is;
- or the scenario studied was fairly similar to another, resulting in a "hybrid" scenario incorporating main aspects from the two source scenarios.

Indeed, some of the scenarios developed in the two groups had their own specific features, while others had many similarities in the variables which are important to identify. For example, Scenario 6 from the second group ("The Mediterranean Sea: global commons") is not included in the DEGEST approach. It cannot therefore be made hybrid, but it is too interesting and useful to be discarded or absorbed by another. Scenario 3 of the second approach (Structural changes in a plural Mediterranean) incorporates most of the variables where economic development takes precedence over ecological considerations. The final title is therefore "Growth at all costs in a fragmented Mediterranean". Analysis of all the variables shows that the two approaches share the same business-as-usual scenario, which incorporates two scenarios proposed by Group 1 (Scenario 1: "Metastable and asthenic BAU" and Scenario 3 - "Pragmatism still trumps engagement", and a third proposed by Group 2 (Scenario 1 - "Mediterranean: battlefield and marginalised").

The scenario titles were then validated with the agreement of all parties

- Scenario 1 - Degradation, inertia and pragmatism

- Scenario 2- Colliding crises and forced adaptations
- Scenario 3 - Growth at all costs in a fragmented Mediterranean
- Scenario 4 - Euro-Mediterranean partnership and a blue-green transition
- Scenario 5 - The Mediterranean, a plural model of sustainable development
- Scenario 6 - Global partnership for the Mediterranean Sea as a commons

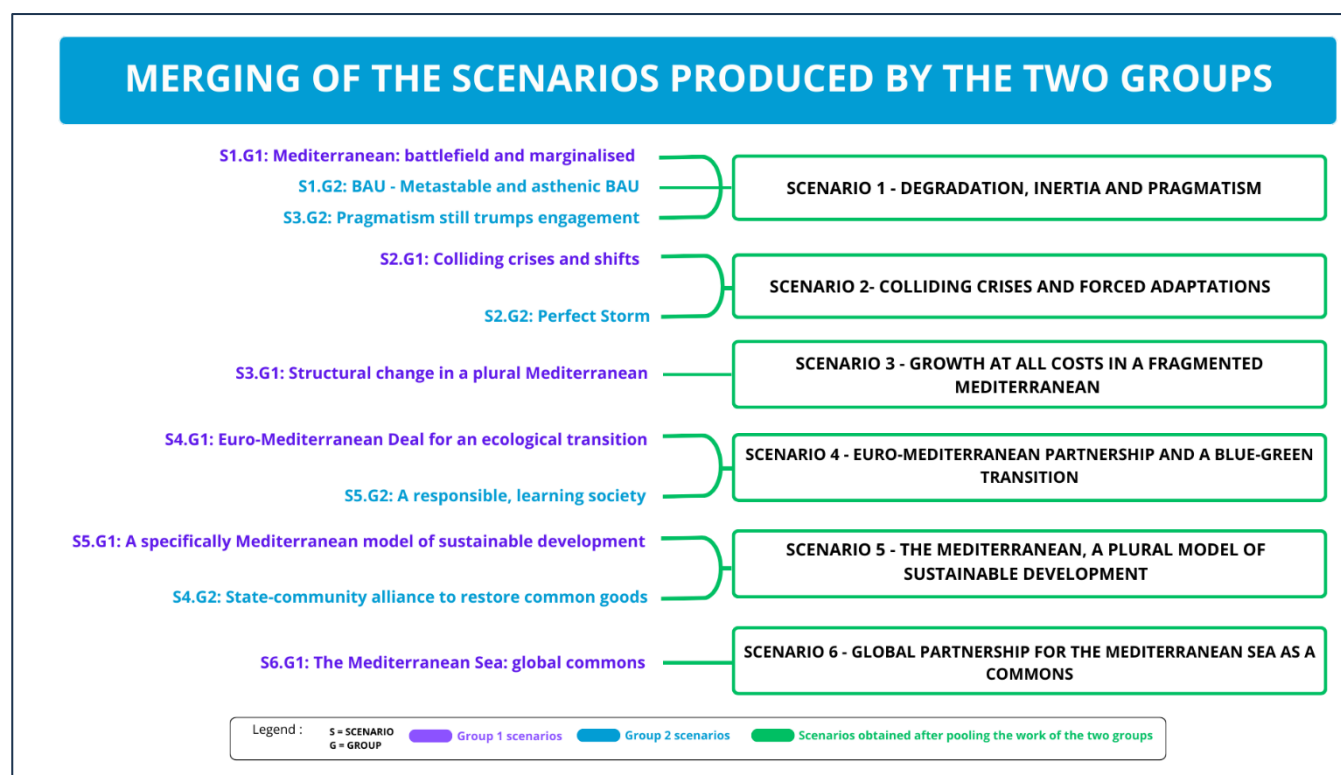


Figure 4. Scenarios obtained after merging the scenarios from the work of the two groups

These proposed titles were stabilised by the members of the steering committee in order to establish the final titles. They are presented in the table below, in 2 distinct categories: scenarios with more or less rapid environmental degradation and scenarios for transition pathways towards sustainable development, which also happen to be scenarios of cooperation at different scales.

Three scenarios with more or less rapid environmental degradation		
1. Inertia, marginalisation of the Mediterranean, and pragmatism	2. Colliding crises and forced adaptations	3. Growth at all costs in a fragmented Mediterranean
Three scenarios for different transition pathways towards sustainable development		
4. Euro-Mediterranean partnership for a blue-green transition	5. Another sustainable development model specific to the Mediterranean	6. The Mediterranean Sea: global commons

Table 7. Scenario titles: environmental degradation versus sustainable development

II. The MED 2050 scenarios

Scenario 1: Inertia, marginalisation of the Mediterranean, and pragmatism

1. Abstract

By 2050, the average temperature in the Mediterranean will have risen by 2.5°C, due to the significant inertia of global climate policies. Mediterranean ecosystems are undergoing major degradation that alters their stability and how they function. Socio-environmental risks (droughts, floods) and socio-political destabilisation (such as an increase in illegal migration) are recurrent, and national economies are undergoing repeated periods of recession. Some countries in economic crisis are becoming more isolationist, managing internal conflicts by establishing non-democratic regimes. The Mediterranean is therefore gradually sidelined from globalisation. Growing internal tensions prevent the emergence of ambitious and sustainable environmental policies. In response to civil societies whose actions are becoming more radical in the face of climate inaction, governments turn to pragmatic and short-term policies that do not address the root causes of problems, and therefore cannot curb underlying trends (such as coastal development), which are nevertheless structural causes of the crisis. Regions hardest hit by climate and environmental changes are becoming uninhabitable, which increases inequalities at the territorial, social and economic levels. The Mediterranean of 2050 is a deeply contrasting space, on the verge of fracturing, divided between a socio-economic elite barely affected by the effects of climate change, and vulnerable populations whose living conditions and future prospects are deteriorating as a result of increasing risks and extreme events such as heat waves, mega-fires and coastal storms and floods.

2. Dynamics and actors

Initial conditions for the scenario

2020- 2030 was seen as the decade for change: this did not occur for two main reasons. First, Mediterranean countries and governments remain divided as to the need to begin a transition and profound change right now, at the expense of economic development. Some countries, especially in the South and East, continue to massively produce oil and gas in an attempt to finance the post-fossil fuel era. Secondly, certain ambitious decisions from the 2020- 2030 decade, such as the ban on combustion engines in new vehicles from 2035, have not seen widespread implementation globally. The lack of action by some countries is explained both by smaller room for manoeuvre and by the political influence of a conservative socio-economic elite that perpetuates itself through the exploitation of polluting resources or unsustainable activities. The economic recession forces governments to make short-term decisions to ensure the safety and protection, and even the survival, of their population. In the North, there has been no trade-off between the “end of the world” and the “end of the month”. Instead, this tension has been heightened. In the South and East, the environment is still not a priority, except in certain vital areas such as water supply. Governments act pragmatically but without ambition because they know that ambitious measures will be unpopular with part of their electorate. The decarbonisation of the economy is still too expensive in the short term for uncertain long-term gains. A “wait-and-see” and *laissez-faire* attitude therefore prevails. The legal instruments available to countries prove their ineffectiveness, because they are not applied. However, some concrete measures are being taken, but mainly in the name of food and energy security. Some sectors (such as the use of biotechnologies in agriculture or the use of shale gas) are being deregulated without planning for the long-term impacts. Here, inertia is not the absence of action but the result of the sum of opposing forces which, by cancelling each other out, prolong the status quo. Mediterranean young people rise up against the inaction of the ruling classes, but are repressed in the name of collective security. The European Union turns away from the Mediterranean, in favour of extension to the East. The Mediterranean cooperation system is therefore gradually losing momentum, due to the loss of confidence in a shared future of progress. This also results in the degradation of resources and ecosystems, sometimes to the point of no return.

Actors and associated stakeholders

Through a lack of knowledge, electoralism, ideology or collusion with the socio-economic powers, governments adopt rhetoric and superficial policies that constantly postpone ambitious decisions, which are the only way to have a positive effect on local and global climate change.

The involvement of the various actors is strongly determined by their specific situations, which are very unequal. Some socio-economic groups, who are often privileged, fuel this status quo, as they suffer little from the effects of climate and global change. Others benefit from the deteriorated state of the Mediterranean system, either because they invest in transitioning sectors, or because they benefit from offsetting measures, thus acquiring part of the public money invested by Mediterranean states.

Mediterranean civil societies, especially young people, try to influence governments, sometimes at the cost of violent action, but without much success. A feeling of resignation is widespread among these young people, with privileged social classes in the North tending to flee the region to settle in economically healthy countries (certain American states, North Europe, New Zealand, Canada). The non-profit sector and informal solidarity networks are increasingly taking the place of governments, particularly in the fields of education, housing and assistance to vulnerable populations.

Different phases

In the decade from 2020 to 2030, there is still hope of deep changes in environmental policies to achieve carbon neutrality by 2050 and curb the increase in greenhouse gases. However, without proactive mitigation and adaptation policies, the Mediterranean gradually faces a series of economic recessions leading to its marginalisation from the global economy. Social and economic inequalities are increasing, firstly in the South and East under the more intense effects of climate change, contributing to an explosion in illegal migration that cannot be contained. Economic stagnation further reduces the scope for redistributive policies, and the wealth produced continues to be captured by a minority of the population, preventing a rebalancing of social inequalities.

The Mediterranean Basin therefore experiences gradual degradation that affects almost all economic sectors and the living conditions of its people. The reason for widespread inaction, or rather superficial policies, without real implementation, is that governments put forward unambitious and cosmetic solutions. In the North, governments are buying the appeasement of different sections of the population - those who are little or unaffected by the future effects of climate change (and who at the same time still vote the most) or those who are likely to be most negatively affected by the necessary transitions.

It is this policy of small steps under constraint (“too little, too late”) that leads the vast majority of Mediterranean countries towards a gradual but irreversible decline after two decades.

3. [Scenario description](#)

External context

While GHG emissions have led to a global warming of +2°C, the Mediterranean Basin is facing more intense warming at +2.5°C. Despite increasing warnings from various international institutions like the UN, IPCC, IPBES, IUCN and World Bank, and annual climate negotiations, countries have not managed to agree on a global and coordinated strategy to drastically reduce greenhouse gas emissions. Some measures, such as the contribution of Northern countries to finance adaptation in Southern countries, have not been ratified, notably because of pressure from certain countries. There is a mistrust of the international institutions inherited from the Second World War, accused by some conservative governments of using the climate issue to serve political agendas. When it comes to climate, like other large-scale problems, superficial and “small steps” policies take precedence over ambitious actions and reality. Following the war in Ukraine, the European Union speeds up its policy of integrating the countries of Eastern Europe (Ukraine, Moldova) for geopolitical and economic reasons. This eastward expansion occurs at the expense of the Mediterranean (and even potentially the Balkans), with the European Union slowing down its neighbourhood and investment policy on the Southern shore. This extension ultimately reinforces inaction on environmental issues, as the European Union seeks an impossible consensus, all the more so as it is being challenged from within by a growing number of populist governments.

Geopolitics and governance of the Mediterranean

At the Mediterranean level, there is also a mistrust of supranational institutions. While some economic cooperation between Mediterranean countries has been initiated around strategic sectors, such as energy, others are facing growing and recurring conflicts of use. The Mediterranean maritime space and coastline is the subject of disputes between increasingly competing uses (fishing, offshore wind power, transport, biodiversity protection, tourism etc.). These uses should be regulated by maritime law and the Barcelona Convention, but enforcement remains lax and inconsistent. The fragmentation of legal tools and the fact that maritime planning is not applied by all Mediterranean countries, particularly with regard to the environmental assessment of maritime activities, result in a state of status quo that fuels conflicts. For example, offshore wind development is a source of spatial competition with other activities such as fishing, military activities and maritime transport.

Globally, the priority given to national interests over supranational cooperation has caused the Mediterranean to lose its influence in the world's geopolitical and economic balances. The Mediterranean, once the centre of world trade, is being marginalised by its inability to engage in long-term policies. The melting of the Arctic ice pack opens up a new trade route for Chinese and Russian container ships, leading to a drop in commercial traffic through the Suez Canal, and therefore a drop in global traffic passing through the Mediterranean. Paralysed by chronic problems of insecurity, incapable of overcoming internal economic difficulties and levels of debt, and sidelined from global dynamics concentrated in Asia and North America, the region sees its place on the world stage shrink unrelentingly.

In this lacklustre context, which is also affecting the Northern shore with its declining population, Mediterranean countries fall back on pragmatic short-term policies in response to the economic and social shocks of varying intensity experienced, without succeeding in reducing their vulnerabilities. Hopes for a reduction in inequalities between the two shores are fading. Some conflicts between Mediterranean countries are dragging on and becoming more entrenched, yet without causing a widespread outbreak. The world's major powers, such as China, Russia and the United States, are clashing indirectly in other geographical areas, such as Sub-Saharan Africa and Southeast Asia.

Without an ambitious policy of cooperation to ensure the co-development of each side of the Mediterranean, the migration issue remains without a permanent solution and greatly destabilises the region. In addition to the intra-Mediterranean migration flows, there are those from Sub-Saharan Africa and countries in Asia significantly affected by climate change (Bangladesh, Pakistan, Myanmar). The migration issue is a subject of strong diplomatic discord between the different Mediterranean countries. It may even be instrumentalised by some governments seeking to influence geopolitical balances ("blackmail over migrants"). For geopolitical and energy reasons (e.g. gas fields) and to meet the challenge of illegal migration, borders and maritime areas are militarised. This arms race heightens tensions between neighbouring countries.

Demographics and regional planning

In 2050, the Mediterranean Basin will have a population of 634 million (compared to 521 million in 2020, +22%), with the Southern and Eastern countries on course to complete their demographic transition. The population of the North will have slightly decreased (-5%), while Eastern countries (+30%) and Southern countries (+44%) will have seen their population increase significantly. There is a general ageing of the population, which is more acute in the Northern Mediterranean than in the Southern and Eastern countries. In some countries, the collapse of the population or, on the contrary, its very rapid growth (like in Egypt), are becoming major sustainability issues, but with no possibility of changing course.

In terms of regional migration dynamics, the Balkans witness a large proportion of their "life blood" (educated young people) flee the region for countries offering better employment prospects, such as Western and Northern Europe. This

phenomenon of the “brain drain” is also at work in the South of the Mediterranean, but is offset by a highly educated diaspora “returning home” after the implementation of policies to encourage their return (higher salaries, creation of economic opportunities, better social status). They invest in adaptation sectors (green energy, desalination, aquaculture, etc.).

Although some relocation of activities and populations to the hinterland and rural areas can be observed, due to the rise of remote work for executives and employees in the tertiary sector and the territorial dynamic of “returning to the countryside” for privileged social classes, the major underlying trends (urban and coastal development) continue to shape Mediterranean landscapes. These fairly rapid changes contribute to destabilising the region’s socio-environmental balance. The vast majority of the population lives in large coastal urban areas, which has negative impacts on environmental and human health (“One Health”). In many impoverished urban areas where extremely precarious populations survive, there is a re-emergence of diseases that had been “eradicated” in developed industrial societies, such as tuberculosis, scabies and syphilis, alongside an increase in diseases associated with poverty and urban sedentary lifestyles, including obesity and diabetes. Climate change, particularly rising temperatures, encourages the emergence of vector-borne diseases, such as dengue fever, zika and chikungunya, carried by tiger mosquitoes (*Aedes albopictus* and *Aedes aegypti*), whose range is constantly expanding.

These large urban areas are also facing increased inequalities. “Slums” sit next to new, highly internationalised neighbourhoods financed by foreign pension funds (following the example of the Euromed district in Marseille). Most of the upper classes work in these business districts, in service jobs, IT, and finance, etc. The residential districts of these social classes are often gated and secure (“gated communities” like in Asia or the United States).

Migration policies remain ambiguous and uncoordinated at the regional level, with no reduction at source or prospects for co-development. They fail to curb ever-increasing migration flows. This growing migration is driven by an increase in conflicts often linked to the effects of climate change, such as famine and drought. They destabilise diplomatic relations between the countries on all three sides of the Mediterranean and weaken their governments, which are forced to face mounting protests. The rise of populism and the exacerbation of anti-migrant hostility lead to the rise of private militias to monitor and contain illegal migration. Migrant populations become scapegoats for a worsening economic situation, with the migration issue capturing most media attention, forcing all political parties to take a stance on this issue.

Economy and development policy

The general state of the Mediterranean economy is gradually deteriorating, even though some sectors involved in the ecological transition (such as energy) are booming. Despite efforts to diversify, a large proportion of countries continue to base their development on the exploitation of natural resources (sea, sun, fossil fuels, Mediterranean products, etc.), which are threatened by climate change and declining yields. Some Southern and Eastern Mediterranean countries nevertheless take advantage of the transition to low-carbon energies by welcoming large infrastructure projects (solar power plants in the desert, offshore wind power near the coast, underground carbon storage, deep geothermal energy) to generate huge financial returns and create jobs. However, this revenue is not equitably redistributed among the population, leading to an increase in GDP, but also to an increase in social and economic inequalities. Some areas with high economic potential but limited investment capacity, whether for renewable energy production, tourism or aquaculture, compete with difficulty for aid, partially from large foreign pension funds, which then take a share of the income. Redistribution policies therefore clash with the interests of those who own the capital and production facilities. Inequalities are widening both within and between countries, some of which are unable to emerge from the deep slump that has hit them since the 2010s. On an economic and social level, the Mediterranean of 2050 is a dichotomy, with a Mediterranean of globalised elites on the one hand and a Mediterranean of vulnerable minorities on the other. Although the energy transition is well under way in the Mediterranean, it is mainly implemented through technologies and for economic profit, without social justice or redistribution policies. The transition therefore happens in fits and starts, without any profound systemic change, according to the whims of sectors facing crisis, and sometimes includes an overturn of the standards in force. For example, to deal with an increase in parasites and pathogens in certain crops, existing legislation on pesticides or GMOs is relaxed.

Large corporations pursue policies of maximum short-term profitability, without taking into account the negative external impacts on resources or the environment. They protect themselves from the criticism of social media and NGOs with elaborate communication policies, enlisting highly paid scientists and influencers with little concern for ethics. They build a “green sheen” (through green and blue washing), based on carefully crafted advertising and the obstruction of legal proceedings against them.

Economies are “greening” primarily for economic reasons. A “green market” is therefore developing. It is attractive to capital and based on carbon offsetting mechanisms and the promotion of ecotechnology “solutions”, such as “green” hydrogen (or labelled as such), or CO₂ storage in underground caverns, etc. In this scenario, “green” investment must be above all profitable, which is also true of the “blue economy”. Through intense lobbying campaigns with various bodies such as the European Commission, large transnational firms in the energy, agri-food and digital sectors influence the green certification and labelling processes. Therefore, in terms of environmental transition, a “small steps” policy still prevails, and the responsibility falls primarily on consumers who are asked to “green” their behaviour. There is no break with the quest for economic growth or consumption, and citizens are asked to behave as “responsible consumers”. Property and “new” products are still socially valued. At a local level, short supply chains, recycling centres and second-hand business (e.g. second-hand clothing stores, repair shops) are nevertheless developing, thanks to support from the public authorities in Northern countries, and due to poverty in the South.

Sectors related to the maritime economy have not made any significant transition towards greater sustainability. Those such as maritime transport, shipyards and tourism continue to be major polluters. In the tourism sector, there is a dichotomy between the development of mass tourism with a heavy ecological footprint (coastal resorts) and eco-tourism in preserved landscapes and socio-ecosystems, which is expensive and reserved for the elite. Some places highly dependent on tourism (such as certain Mediterranean islands) are suffering the full force of climate change. To continue to welcome tourists and preserve the huge financial gains that come from it, these territories must adapt defensively to climate change. They are therefore forced to turn to foreign capital to finance major defence and development infrastructure, such as dikes, pilings, irrigation and reforestation, etc. Those who do not make this choice are downgraded and become impoverished. Despite several attempts to regulate the exploitation of marine resources more strictly, no consensus on a Mediterranean-wide scale has emerged due to the persistence of conflicts over the boundaries of exclusive economic zones.

Science and Technology

Despite the declared intentions of Mediterranean leaders for the region to serve as a hub for new green technologies (alliance for green hydrogen, offshore wind farms) and develop a long-lasting partnership between Northern and Southern countries on digital technologies, the Mediterranean has not managed to catch up with the American and Chinese giants of digital and other new technologies. The European Union is developing a plan for digital sovereignty that gives it a degree of independence, while in the South, the digital divide persists, limiting prospects for economic development. However, Europe itself does not have the resources to match its ambitions, and the share of patents and scientific publications from Eastern and Southern countries remains marginal. Critical and vital digital infrastructure in these Mediterranean countries is owned by major global groups (Asian or American). Some global tensions (for example between China and the United States) therefore have repercussions on the interoperability of digital infrastructure and systems, and lead to recurrent outages. To meet the Sustainable Development Goals (SDGs), Mediterranean countries are strengthening their surveillance and monitoring capacities based on new information and communication technologies (NICTs), including smart sensor networks, remote sensing via satellite and drones equipped with Lidar systems, etc. However, due to a lack of public resources, research and observation are increasingly financed by private funds (particularly the GAFAMs or Asian equivalents). These high-performance monitoring systems are therefore designed to meet economic rather than ecological objectives. As scientific interests give way to economic interests, data sharing is hindered by tolls or fees, and observation systems continue to have poor interoperability. Security-sensitive data is still controlled by governments. In the end, the increase in Mediterranean socio-ecosystem monitoring capacities has limited influence on the decisions taken by governments when it comes to sustainable development. Radical decisions are constantly postponed, despite increasingly urgent warnings from civil societies around the Mediterranean and the world. In some countries, climate scepticism is even on the rise.

Society

Deteriorating living conditions and increasing inequality have created a breeding ground for anti-globalisation and conservative political movements and radical religious currents opposed to the emancipation of some populations, such as women. These movements, some of which are cult-like (such as the new age movement), are gaining an increasing audience. Internet smear campaigns and even physical violence are used against environmental activists, such as journalists who document and expose conflicts of interest and collusion between corporations, governments and regulatory institutions.

Mediterranean young people, whose future prospects are dimming, are increasingly isolated from the rest of society. Intergenerational conflicts are on the rise. The youth blame the previous generations and past governments for successive climate disasters, and a “wait-and-see” approach in the light of their acceleration. Movements for the rights of future generations are growing.

In the North, young people mobilise in large numbers to oppose unsustainable or unsuitable projects (such as water reservoirs in the plains). Faced with policymakers failing to take into account their demands, these protests are becoming more radical and increasingly violent. At the same time, in order to buy a form of social peace, decision-makers increase the number of consultation and participation bodies (e.g. youth conferences on adaptation), without it having any influence on decision-making. This situation reinforces the frustration of young people, who lose confidence in the electoral process and usually abstain from voting except in local elections. Young people gradually leave public life and marginalise themselves by distancing themselves from decision-making spheres.

In the South and East, youth protests increase, as they bear the full brunt of climate and environmental changes, making their living conditions precarious (basic needs such as food and housing, etc.). Educated youth from the wealthy East migrate to countries that offer them satisfactory living and working conditions (Northern Europe, the United States, Canada, etc.), while the vulnerable youth of the South emigrate to France, Spain and Italy to take up jobs considered unpleasant and unwanted by the local population.

The status of women in the Mediterranean is subject to contrasting developments, with a local decline in certain fundamental rights (difficulty accessing employment, wage inequalities, etc.), due to the consolidation of power by certain political movements, sometimes bordering between politics and religion.

Governance

The role of civil society remains mixed and controversial. On the one hand, some associations try to promote measures to protect nature, human rights, or justice, as the three are often linked, but they are opposed by many organisations, which are hostile to any change in the system resulting in losses of income or power, and that would therefore be unfavourable to them. These tensions or conflicts are exploited by extremist pressure groups whose political agenda goes beyond environmental issues. On the other hand, there are more and more consultation and negotiation mechanisms, but they do not produce social acceptability, because, for reasons of financial and political power, decisions almost always go the way of the project owners, which reinforces the feeling of mistrust towards politicians and policymakers.

Governance of the marine space remains in a state of status quo, with no real progress. This space is subject to state and economic interests that hinder any action towards sustainable management. The Mediterranean is subject to internal geopolitical and diplomatic tensions (e.g. over the regulation of illegal migratory flows), which prevent the development of cross-cutting, inter-state policies for sustainable development and the definition of coordinated strategies able to tackle the vital emergencies affecting the sea and the entire region. In the end, the Euro-Mediterranean partnership for sustainable development, which was reaffirmed ambitiously between 2020 and 2030, does not lead to long-term co-development and is limited to economic cooperation. Nevertheless, the initiatives taken to strengthen protective measures, extend the law, implement sustainable development goals, and coordinate disaster responses, etc., are still too disparate to have a decisive impact and remain too little enforced for lack of an effective monitoring system.

Despite this, some cooperative projects become a reality, but these are mainly in strategic or crisis sectors, such as energy, agri-food or fisheries. For example, this is true of European Union imports of gas extracted from the Mediterranean to replace Russian gas since the war in Ukraine.

Countries adapt as they go along, in particular through pragmatic actions or regulations in response to emergencies, usually without addressing structural problems. Policies are increasingly determined by events and communication needs. Some controversial sectors are progressively deregulated (biotechnology, genetic manipulation, etc.).

Sectoral conflicts emerge due to decisions of short-term interest that take precedence over planning for future crises and disasters. For example, in order to develop tourism, golf courses and swimming pools continue to be built in regions affected by increasing water stress, and waterfront residences are built without taking into account the increase in coastal storms or ICZD (Integrated Coastal Zone Development). Some measures undertaken do nevertheless improve the living conditions of Mediterranean populations, such as the greening of public spaces or the development of short supply chains in the food industry.

Land and marine environment

In 2050, carbon neutrality has not been achieved. However, mitigation policies are generally more advanced in the North than in the South, although medium-term economic profitability there still takes precedence over sustainability. State investment remains low due to limited room for manoeuvre in budgets, and major infrastructure or land redevelopment initiatives are mainly left up to private actors (due to a poorly regulated carbon market and tax relief measures that do not sufficiently take into account the environment). Adaptation policies, in the South as well as in the North, are implemented in a reactive manner, prioritising areas of high vulnerability. Governments solicit action from individuals or associations, and prepare vulnerable populations for the culture of risk (floods, forest fires).

Local adaptation prevails over strategic structuring. The South develops gravity-fed and localised drip irrigation and crops that consume less water. Nevertheless, some countries gamble on technological solutions with true progress slow to materialise, leading to chronic food shortages.

As efforts to improve the sustainability of production or consumption systems can provisionally lead to a decline in competitiveness or living standards, and in living conditions, environmental taxation and taxation of the carbon footprint are stabilising or even declining. While Southern Mediterranean countries are forced to fall back on this “forced” resilience to adapt to climate change, Northern Mediterranean countries still focus on changing individual behaviour and developing a culture of risk. In some cases, this prevents catastrophic damage, for example in the prevention of mega-fires, but fails to address root causes.

Marine ecosystems are strongly affected by climate change, which leads to profound changes in functionality and productivity. Biodiversity protection measures (such as Marine Protected Areas) focus on emblematic species such as turtles, red coral and Posidonia. Transplantation projects for Posidonia are financed by major Mediterranean shipping companies through the establishment of an environmental offset mechanism. “Alien species” that are not necessarily “invasive” (with a proven negative impact) continue to spread throughout the Mediterranean with accelerated changes to certain ecosystems and new production channels, such as the blue crab.

In the end, after initial backlash from public opinion unhappy that the Mediterranean Sea is changing, this uncontrollable evolution of ecosystems is gradually being accepted. Land ecosystems are also undergoing increasing degradation due to climate change, and urban, coastal and metropolitan development. Droughts and heat waves disrupt food production and supply, and increase imports of basic necessities. Some countries specialise in the production of agricultural raw materials because they still enjoy a favourable climate. High-tech companies that produce synthetic food (both meat and vegetables) profit from this and acquire dominant positions in crucial food security markets. Subsistence agriculture in the Southern Mediterranean is in decline, contributing to the rural exodus, metropolitanisation and the rise in numbers of migrants between the South and the North. To meet the challenges of food sovereignty, resources of available land, water and species are further stretched, especially by the expansion of intensive agriculture and unsustainable farming systems, such as fish farming from wild fry in rice fields salinated by rising sea levels. Water crises and conflicts of use related to this resource are on the rise. The technological solutions proposed often remain controversial (e.g. water storage ponds for use in the summer or desalination).

This is a disunited Mediterranean, plagued by social and territorial inequalities, that must face major climate turmoil. The various actors and stakeholders (governments, industries, businesses, etc.) pass the buck. This lasting status quo leads the Mediterranean towards a trajectory of degradation on many levels. With the exception of young people, this failure to bear responsibility for climate change and biodiversity is shared by most Mediterranean social categories. This is the true explanation for this downwards slide of the Mediterranean system. While the Mediterranean Basin is still habitable for a large part of the Mediterranean population in 2050 and a few symbolic or cosmetic actions can still be taken, its climate and environmental trajectory will considerably modify and disrupt the socio-ecological and living conditions of populations in the second half of the 21st century. Is this trend irreversible after 2050? The survival of this great region depends on the ability to respond collectively in time. However, this dark scenario may be necessary over two or three decades to spur the impetus for radical change in all vital areas of the Mediterranean region.

Scenario 2: Colliding crises and forced adaptations

1. Abstract

During the three decades following the year 2020, the Mediterranean has progressively plunged into a spiral of multiple crises that are running out of control beyond most forecasts. Their causes are both internal and external to the region. Mediterranean countries as a whole, although particularly vulnerable, have not taken the necessary actions to prevent risks that have been known for a long time. The inadequacy of prevention and adaptation policies is generating new crises that radically change all the characteristics of the region. In a context of chronic instability, there is a deep disintegration of the Mediterranean's political institutions, economic and environmental collapse, an increase in inequalities in access to resources, as well as the multiplication of violence and food riots with a heavy human cost. Fractures are becoming established or deepening at all levels: between the shores of the Mediterranean, within the states of the region, as well as between the populations of the Mediterranean Basin. However, the early 2040s will see the gradual arrival of a turning point that marks a break with traditional lifestyles and consumption patterns. To survive, Mediterranean countries are forced to embrace various adaptation strategies. Authoritarian modes of governance centred on energy sobriety and frugal consumption patterns are imposed in some regions around the basin. In others, communities organise themselves locally to compensate for the lack of public action and meet their own needs. Food and water security are becoming an absolute priority all around the Mediterranean. They require a profound paradigm shift, which is the only viable solution for escaping the chaos and chronic dependence on international aid, when it is still available.

2. Dynamics and actors

Initial conditions for the scenario

The prerequisite for this scenario is that the worst contextual hypotheses are confirmed or even exceeded, at both the international and Mediterranean levels. The Mediterranean system is unstable, in particular with environmental risks (droughts, heat waves, floods, tsunamis, earthquakes, erosions/landslides, etc.), overexploitation of resources, a tense geopolitical, economic, demographic and financial context, significant social inequalities, and vulnerability linked to food and energy dependence and tourism. A second condition is the inertia of regional governance, and the inability of major political actors to implement the profound changes necessary for sustainable development, which could have led to the emergence of systems for preventing crises and their impacts.

Actors and associated stakeholders

- Governments: governments are failing to provide basic public services (employment assistance, education, security, public health, transportation, energy). The governance of the region, as we knew it in the early 2020s, is collapsing, and giving way to isolated authoritarian regimes and self-managing local communities.
- External actors: they are losing interest in the Mediterranean. It is no longer attractive and is considered too unstable to envisage large investments in technology, research and training. A few specific actors, especially the GAFAMs, maintain activities in the Mediterranean thanks to the anarchic privatisation of essential resources.
- Political parties: the political landscape is becoming more radical, with a significant rise in populist and nationalist parties. Opposition is violent. Political life is fractured, with inter-generational and inter-cultural divides. There are hunger riots and increasingly violent demonstrations as poverty increases.
- International institutions: international institutions are becoming much weaker and exist now only on paper. There is no longer any real international cooperation in the region. Only a few humanitarian programmes continue to support the Mediterranean. Some international foundations and diaspora funds artificially support the economy, but in an unstable climate.

- Small groups and civil society: political life is organised at the community level. A new social dynamic emerges, leaving more room for civil society. Its role shifts from a minor to a major role. Several pressure groups and new NGOs try to give credibility to their position in the political landscape.

Different phases

Three phases shape this scenario:

2020-2030: Series of crises. The Mediterranean is subject to a series of disasters, starting with a succession of droughts and heat waves and increasing instability in the international economic and geopolitical context. This situation leads to serious internal crises in the region, in the ecological, economic, social and political spheres. These crises diversify and increase in frequency, including extreme natural events, economic and financial crises, food and resource crises, pandemics, mass migration, fuel shortages and intermittent access to electricity, governance crises, and armed conflicts between countries and within countries.

During this period, Northern countries obsessively try to regain their pre-crisis levels of performance, particularly economic performance and “comfort”, while also increasing their number of disaster management systems. On the other hand, SEMCs strive to catch up with the level of economic development of Northern countries, whose model is fundamentally based on unsustainable economic development. Both sides exhaust themselves trying, yet fail to plug the gaps and handle emergencies. By failing to recognise that the dominant system is dysfunctional and unsustainable in the long term, these approaches only accelerate the recurrence of new crises during this first phase.

2030-2040: Exhaustion, general breakdown and chaos. The entire system is running out of steam, with a marked divide between the Northern and Southern Mediterranean, and within individual countries. The system has reached the end of its tether and can no longer absorb shortages (food, energy, water, etc.) and disasters (natural and health disasters, armed conflicts) in the region, after removing strategic infrastructure (telecommunications, transport, energy and water generation and transportation infrastructure) and stopping public services in most places. This general chaos causes a high mortality rate, which deeply marks the trajectory of the Mediterranean region.

2040-2050: Emergence of local resilience and sobriety, by necessity. A paradigm shift is forced upon Mediterranean people through pain and urgency, as they adapt to the situation in order to ensure their survival and gradual exit from chaos. Political alternatives are put in place to compensate for the collapse of the most fragile states that are unable to provide basic public services. Depending on the country or community, this adaptation is achieved either by authoritarian regimes or by self-organised local societies, with differing levels of democracy. The search for resilience in the face of these crises is linked to the search for autonomy, particularly for water, food and energy, or the domination of communities that have access to these resources. The Mediterranean is dislocated, but reinvents ways of adapting to these brutal changes.

3. Scenario description

External context

Since the 2020s, the world has been confronted with a succession of crises in the financial and economic, health, ecological, social and political spheres. International regulations have proved ineffective or powerless in these circumstances. These repeated crises are caused by the acceleration of structural imbalances and maldevelopment. Overall, globalisation is running out of steam and is beginning to show more negative than positive results. For a long time, this globalisation was presented as “fortunate” as it took over from national developments, such as the “*Trente Glorieuses*” in France, the emergence of the Four Asian Dragons, or the expansion of China. However, this evolution ultimately generates more losing countries than winning countries, and contributes to the growth of inequalities and, above all, to the inability of countries to safeguard common goods such as the climate or biodiversity. The international context is therefore marked by strong economic instability and by a recurrence of crises caused by excessive debt levels in certain countries, inflation, rising interest rates, payment defaults, unemployment, and by adjustment programmes in the face of these economic realities. Moreover, the financial and property bubbles have burst. This situation has a strong impact on the Mediterranean region, which is particularly vulnerable to external factors, due to its dependence on food and energy imports and tourism. The Mediterranean suffers all the more because its capacity to adapt is weakened by

several factors: the vulnerability of its ecosystems, the overexploitation of its natural resources, the more intense effects of climate change compared to other global regions, the high debt levels of most Mediterranean states, and the permanence of strong social and geopolitical tensions, particularly in the Eastern half of the region.

Global efforts for climate change mitigation have not achieved the goals of the Paris Agreement. As they continue to push global economic competition ever further, states are doing nothing to curb globalisation and its deleterious effects on the environment. The global temperature rise curve follows the worst-case scenarios. At the same time, concerns raised since the early 2020s about the possible interaction between exceeding several tipping points become a reality. With global warming expected to exceed two degrees Celsius by the mid-2030s, the ice caps of the Antarctic, Greenland and Barents Sea melt much faster than predicted, drastically increasing sea level rise and putting pressure on coastlines around the world. The average temperature in the Mediterranean region is set to rise by 2,8°C by 2050. The trends of sea warming and acidification are on the rise, and the risks of water stress are intensifying and reaching most Mediterranean countries. Mediterranean countries lack the resources, means, stability and, above all, coordination to implement effective preventive actions in the face of an increase in the number and unpredictability of extreme events, such as droughts, floods, heat waves and mega-fires that hit the region.

All over the world, states and certain groups that can ensure their own security and survival are retreating behind “fortresses”. New borders are emerging, in the form of protected enclaves and gated residential areas. This context of increasing fragmentation is accompanied by the rise of more authoritarian regimes in the North, and a reduction in the role and influence of traditional political actors, such as parties, trade unions or associations. This fragmentation contributes to an increase in local tensions, conflicts and collapses that are gradually becoming systemic and increasingly international. Cooperation struggles to respond collectively to regional issues affecting all countries, such as freshwater management, water quality, or the restoration of land and marine biodiversity. International organisations limit their activities in the Mediterranean to humanitarian aid in order to address the most urgent needs. This situation accentuates the dependence of the most vulnerable populations on imports of basic necessities (drinking water, foodstuffs, medicines). This growing insecurity increases tensions between vulnerable social groups and wealthy elites who hijack most international aid for their own benefit.

✕ Geopolitics and governance of the Mediterranean

This economically fragmented and chaotic Mediterranean is just as fractured geopolitically. The systems of governance and internal politics in the region are disintegrating at several levels.

First, the international community is gradually losing interest in the Mediterranean due to the decline of its strategic value and its growing instability. Only large digital or mining companies, especially from America and Asia, are taking advantage of this instability, or even chaos in certain regions, to exploit easily accessible resources (e.g. fishing rights) or take control of vital infrastructure (ports, airports, telecommunications networks, etc.).

At the regional level, various long-standing tensions are evolving into armed conflicts under increased pressure from the state of crisis facing the environmental, financial and political systems. In the East, open conflicts are breaking out over the sharing of water resources. Continued aridification of the land, rising temperatures and falling rainfall mean that water is becoming the most precious resource, and sharing it leads to the outbreak of armed conflicts. Countries that control areas upstream of the region’s major rivers try to extract as much profit as possible, leaving just a tiny share of the resource for countries downstream. Diplomatic solutions have failed, meaning that the only solution left to threatened countries is to go to war with their neighbours. In the South, the arms race and geopolitical rivalries have led to local border skirmishes, which were small-scale but have resulted in a definitive breakdown between neighbouring states. Finally, in the Balkans, a deterioration of ecological conditions is further accentuating the divide between rural and urban areas. This often follows ethnic divides, with the ghosts of civil war reawakening and violence breaking out within countries.

The European Union is unable to find coordinated peacekeeping solutions between its Member States, and halts its neighbourhood policy with its immediate neighbours. Several Northern EU countries have made their continued

membership contingent on ceasing to provide aid to Southern and Eastern countries and on the strict closure of borders. This turning point, during the early 2040s, reveals the North-South Mediterranean divide, which has been latent since the late 1990s. This geopolitical divide between the two shores of the Mediterranean is causing enormous tensions within the EU, with some countries calling for a move towards greater security and autonomy, and others seeking to maintain a minimal flow of migration in order to avoid the accelerated ageing of European populations. Ultimately, the EU splits into two groups because neither diplomacy, political will, nor economic benefits can effectively curb the centrifugal forces at work. Added to this are the many secessionist movements within Member States, which are accelerating the disintegration of institutions.

In the South and East, profound political differences between countries and disparities in wealth make it impossible to build a common regional project, even if it is only an institutional façade. As a result, cooperation between countries or communities remains limited to a few bilateral programmes, particularly in cross-border regions, and it relies on the many diasporas. The maritime space is also militarised, with armed groups and disputes over borders and the control of marine and coastal infrastructure that frequently degenerate into territorial conflicts.

At the national level, the widespread retreat into sub-regional identities leads to a chaotic breakdown of the Mediterranean political system (mafia takeovers, secession of provinces, local power grabs by populist and nationalist groups). As the central states weaken, there is a “Springtime of the Mediterranean peoples” - a wave of nationalist independence. All across the Mediterranean, in the North, South and East, nationalist movements break out, people take up arms and win their independence. In the North, this independence is won with less violence than in the South and East, but they plunge the EU into a new crisis thus accelerating its collapse. In the South and East, independence leads to lasting conflicts between the new states and those to which they had previously been attached.

Many states are no longer able to provide reliable public services, abandon any desire to protect the environment, and no longer comply with most international conventions. They are refocusing on disaster management. Some states become institutional fronts behind which new political actors operate (militias, nationalist parties or radical religious parties). Corruption is widespread, and further undermines governments’ ability to take action. Some states take an ultra-protectionist inward-looking stance, strengthening border controls and attracting capital and people who are looking for security first and foremost. The most vulnerable areas and those hardest hit by crises are abandoned. Unstable political movements take advantage of this climate of uncertainty and instability to declare improbable independence. In some areas, professional military and private militias attempt to hijack strategic infrastructure and resources for their own benefit, leading to recurrent escalations of violence between different groups. Difficulties in the supply of energy, water, food and basic materials lead to increased precariousness for populations, who depend on external aid regardless of the source: predatory states; lobbies; mafias; financial, industrial, agri-food or IT oligopolies, etc. In many countries, this situation of social precariousness and chronic instability leads populations to question the legitimacy of the public authorities, which are considered incapable of meeting their minimum needs and providing essential services. Political violence takes hold.

Generally speaking, in the North, the state manages to maintain its integrity and continues to perform its governing functions of law and order, preserving a fragile yet still present rule of law. On the other hand, in the South, the relative lack of state resources compared to those in the North makes them much more vulnerable to systemic crises on this scale. Administrations collapse, and the most fragile states break down. On the other hand, since local solidarity networks are denser and stronger in the South, societies in the region are better able to absorb the shock, and are much more resilient than in the North, where societies are much more fragmented and completely disorientated.

In this chaos, informal modes of self-organisation develop in response to the shocks caused by the succession of crises. Some communities stand out for their adaptability and resilience. Based on informal solidarity systems, local communities develop their food autonomy and low-tech nature-based solutions to resist the crisis.

Demographics and regional planning

Demographic changes are of particular importance in this scenario, as they are both a source and a major consequence of the crises that characterise it.

First, a source: while long-term demographic trends continue to follow the trajectory of previous decades, with demographic and urban transitions continuing, by 2050 almost all Mediterranean countries will be facing sustainability problems linked to these changes, with extremely contrasting situations depending on the region. For the first time, the

North is experiencing (net of migration) an overall decline in its population of almost 10% (18 million fewer inhabitants), and in some countries even more, with a rate of ageing that will reach an average of over 30% by 2050, and in some cases 40%. Conversely, in the South and East, the population continues to increase significantly, rising from 200 million to almost 300 million in the South, and from 122 million to 160 million in the East. By 2050, these two regions will account for almost 70% of the Mediterranean population, compared to just over 60% today. Although the ageing trend now affects the whole region, the geographical age imbalance between young and old is still significant, with over 55% of the elderly population concentrated in the North, and an even greater proportion of the young population living in the South and East. In a Mediterranean region that is already highly vulnerable and facing major physical constraints, the combination of these demographic changes and a context of intensifying external imbalances concerning the economy, climate or ecology increases the risk throughout this period of unmanageable tensions and unsustainable situations that could turn into crises. This is all the more true given two other trends: an urban transition which, with some exceptions, is coming to an end, with more than 80% of Mediterranean people living in cities by 2050, and a concentration of populations along the coast, where, by this time, more than half the population could be concentrated, compared with around one third in 2020 (according to some statistical estimates). With employment crises, housing crises, water or resource crises (including food crises), conflicts over land or coastlines, etc., all these demographic trends carry with them potential risks of multiple crises on a local and/or national scale over the next 30 years.

However, due to a deterioration of the economic and ecological situation, these trends are significantly curtailed and may even be reversed by the end of the period. The succession of crises, which have hit people hard, have three types of gradual impact:

- spectacular increases in mortality: due to diminished access to healthcare and budget cuts to public health systems, antibiotic resistance causing many deaths that were previously avoidable (more deaths recorded in 2050 due to antibiotic resistance than due to cancer), pandemics, armed conflicts, extreme natural events (fires, floods, droughts, “*medicane*” tropical storms), multiple sources of pollution, and famine;
- declining fertility: by choice, or because of increasing biological incapacity due to pollution and the impact of crises on physical and mental health;
- migration chaos: an explosion in flows of all origins, without cooperation between countries. The Mediterranean is facing withdrawal and isolationism from countries, but also the explosion of migration linked to climate change and violent conflict. The virtual disappearance of subsistence farming in the Southern Mediterranean causes a mass rural exodus (more metropolisation) and migratory flows, firstly within countries, but also between the Southern and Northern shores. However, due to the instability of the Mediterranean region, most economic migrants and climate refugees try to reach Northern Europe. The Mediterranean thus becomes a temporary crossroads of migration rather than a chosen destination. When possible, the elites flee the region and head for new hubs (Canada, New Zealand, Australia and Northern Europe) in search of a stability that cannot be found in the Mediterranean. Mediterranean diasporas are scattered across several continents. Uncontrolled urbanisation and the breakdown of public services make the coast uninhabitable. The risks associated with climate change and pollution, as well as its unsuitability in a context of necessary subsistence farming, become a deterrent for life on the coast. By the end of the period, the consequences of rising sea levels also begin to emerge, for example in the Nile delta. In the North and in the Balkans, communities settle instead in the hinterland and inland. In the South, as a result of the aridification of the hinterland, populations find themselves squeezed into a narrow strip of habitable land. Population density explodes throughout the region, making living conditions and adaptation even more precarious.

Economy and development policy

The Mediterranean weighs less and less in the world economy, with dramatic local collapses. The crisis begins with disruptions to water supplies, which heavily impact other sectors (agriculture, fishing, tourism, etc.) with serious economic, social, geopolitical and environmental consequences. The second cause aggravating systemic crisis in the Mediterranean is the energy sector. With oil and gas resources starting to run out, political and economic players realise that they no longer have enough fossil fuels to extract the materials needed to build renewable energy sources. The

energy transition is devouring resources, particularly minerals, which can only be accessed on a large scale using machines that are themselves very energy-intensive. The window of opportunity for achieving the energy transition has therefore gradually closed, due to the inaction of governments in the region. Energy demand exceeds supply, which leads to intermittent supply and an overall increase in costs. Gradually, through a domino effect, all economic sectors (primary, secondary and tertiary) are affected by this energy crisis. Whole parts of the economic system collapse as it is built on permanent, cheap and virtually unlimited access to energy, and on globalisation.

Mediterranean countries that produce fossil fuels, especially gas, and countries close to energy autonomy (considering all energy sources), are more resilient to crises, which leads to new power relationships. Those with sufficiently stable allies outside the region receive conditional and interested support to keep certain strategic sectors of their economies afloat (water, food, energy, etc.), thus creating new dependencies and fragilities.

In 2020-2030, in an attempt to overcome the various crises, Mediterranean states fall deeper into debt, according to their respective capacities and up to a certain limit. It becomes increasingly difficult for states to meet their repayment deadlines. The financial markets get scared and increase their interest rates, creating a vicious cycle: the debt burden is rapidly becoming unsustainable. The collapse of the public finances in several states leads to the collapse of a number of financial markets. Stranded assets held by banks, in particular investments in activities that required permanent and cheap access to energy, water or imported materials, are taken over at low prices by speculators or political actors interested in increasing their sphere of influence. In the North, the European Central Bank (ECB) does all it can to save the European banking system, but is failing. Institutional investors, pension and insurance funds, along with sovereign wealth funds and banks, are the first to attempt to speculate on a rebound of the Euro. But without the support of a credible renewal of the European project, and under pressure from inflation, these measures are actually leading to a loss of confidence in the Euro, which is seriously depreciated in relation to other strong currencies considered more reliable. This phenomenon is becoming one of the causes of the disintegration of the European Union, which has already been weakened by internal divisions. This is leading to a severe destabilisation of the global banking system. Like some Northern Mediterranean countries, several Southern countries declare themselves bankrupt, especially those without energy autonomy. Foreign investment in the region becomes scarce, with credit conditions that are more like usury. But the economic disorganisation is such that no serious, respected and lasting regulations can be implemented.

In the agricultural sector, most large-scale farms have been abandoned. The high cost of energy and inputs (seeds, fertilisers, pesticides), which are mostly imported, and the drying up or inoperability of water tables, due particularly to salinisation, are the main causes behind the bankruptcy of these large agricultural enterprises. The Western Mediterranean no longer serves as Europe's breadbasket and vegetable producer, and agricultural exports to other Mediterranean countries are declining. At the same time, as a result of land aridification, agriculture is collapsing in the South. The region is the world's largest importer of wheat, and is becoming dependent on mass imports of essential foodstuffs. Countries such as Russia, where global warming is making previously frozen land available for growing crops, are taking advantage of this to increase their influence in the region. These imports lead to a disruption (speculation, instability) in the prices of basic foodstuffs, aggravated by the increase in transport prices at the global level. Hunger riots are breaking out in various Mediterranean countries. Frequent and large-scale stock-outs lead to revolts, looting, and even political destabilisation. In these conditions, low-tech and agro-ecological solutions are proving their resilience, and are being mass-developed in local communities in search of food autonomy.

The exploitation of living marine resources continues without enhanced cooperation and governance efforts to try to achieve sustainability. Regulatory structures are gradually marginalised, such as ICES (International Council for the Exploration of the Sea), the Barcelona Convention and even the competent commissions of the United Nations such as UNEP or FAO. In the absence of effective regulation, control and sanction systems, non-Mediterranean actors are taking advantage of weakening local competitors to capture the majority of resources. A decline in fishing productivity reinforces the justification of the development of coastal or lagoon aquaculture, with the primary objective of reducing the risks of protein dependency and food crises. In some cases, this change leads to the emergence of important sectors, especially when vast coastal areas are affected by irreversible soil salinisation due to the rise in sea level and the lack of freshwater supply from rivers. In these areas, the conversion of agriculture to aquaculture in brackish water is systematically supported by states still able to do so.

Main mining companies start or intensify extraction and refining activities in the region for metals that are essential to many industries (lithium, cobalt, copper), with very little consideration of the environmental, social and health impacts. The increase in the price of almost all materials and the disintegration of the international market have made these mining

activities in the Mediterranean profitable. However, these activities have limitations related to the size and dispersed location of deposits, the lack of infrastructure, the lack of training of specialised personnel, and the need to secure the entire processing chain up to the end products.

Once an emblematic pillar of the Mediterranean economy, tourism has declined following successive crises, including the consequences of accelerated global warming and increased insecurity. The last sector to resist is the cruise industry. Only the wealthiest elites continue to enjoy nature tourism in a few “parks” or protected enclaves. Mass tourism infrastructure is deteriorating and falling into disuse. Some generally isolated facilities, such as old hotel complexes or disused airport buildings, are taken over more or less legally by self-managed communities or migrants grouped by language or nationality. Most swimming pools have also been converted into storage for materials, rubbish dumps, vegetable gardens, and rainwater or wastewater recovery systems before the water is processed by tradespeople for reuse.

2040 - 2050 witnesses the emergence of a survival economy, spread across the entire Mediterranean region, which creates new economic opportunities. For example, the Mediterranean landscape is strongly impacted by an accumulation of waste and mismanagement over several decades. In the face of the energy and financial crisis, the waste management chain is chaotic, especially for electronic waste and abandoned vehicles. The number of open dumps is increasing, including on the coast where populations are concentrated, with an increase in microplastic pollution and toxic products penetrating the soil and flowing into rivers and then the sea. However, micro-scale recycling and reuse activities are established on a decentralised basis. In parallel, short supply chains and circular micro-economies based on swaps, solidarity networks and new local currencies are set up, like a parallel economy based on the black market. These alternative markets, initially positioned as a complement to the large dominant markets, gradually become more widespread as very agile and adaptable solutions, which are therefore ultimately sustainable in this critical and unstable context.

Some large financial, industrial or agribusiness groups, and even some states, take advantage of this climate of instability and corruption-prone governance to gain access to certain resources considered strategic, such as arable land, water and energy resources, etc. A few groups claiming to be revolutionaries take over entire territories, which can be captured and kept under control more easily thanks to easy access to the large arms market. Weapons are circulating on a large scale, because they are of interest to all actors, from states to the black market. The justification is always for the legitimate defence of territory, resources and short-term security in a global context of violence and threats of multiple kinds.

This economic chaos is leading to a paradigm shift for most economic actors. The quest for economic growth was formerly the driving force behind decision-making, but is being replaced by the search for survival and thus maximum resilience, whether through strategies of self-reliance, mutual aid or domination. While fossil fuels are still used in the absence of other alternatives, they will become rarer and more expensive, and therefore less used from the 2030s. This trend towards economic slowdown, even if it takes little account of the negative impacts on the environment, nevertheless contributes to a certain reduction in the carbon footprint of human activities. The global scarcity of all resources is leading to even greater shortages in the South and East, which were already occasionally experiencing these phenomena for certain resources. In the North, societies are adopting more frugal lifestyles, with sobriety imposed more out of necessity than choice.

Science and Technology

The region is increasingly lagging behind in technology, digital advances and research, due to a massive reduction in both foreign and domestic investment, poor access to electricity and difficulties in sourcing critical materials. These materials (such as rare-earth elements) are essential for many technologies, but become almost inaccessible in this context of multiple crises. The usual research, development and innovation circuits lose resources as soon as they work outside of short-term applications. States no longer have the means to conduct public research. In this context, a few large players, often from overseas, monopolise technical, financial and information resources, without helping to reduce the crises facing the region.

Transportation-related infrastructure is gradually becoming less well maintained. The Northeast shipping route between Asia and Europe has become a reliable waterway for most of the year for three reasons: first, global warming, which leaves a large part of the Arctic Ocean as open water most of the year; second, the establishment of a service of high-powered ice-breaking vessels under three flags (Russian, Chinese and American); and finally, the status of international railroad given to this route, which is under permanent high international surveillance. This Arctic route will reduce freight costs and delays by 30-40%, while the traditional supply route to Europe via Malacca, Bab-el-Mandeb, Suez and Gibraltar will lose much of its competitiveness. In addition, there is a sharp decline in maritime transport due to de-globalisation. However, the Mediterranean Sea still has the advantage of being an emergency route in the event of geopolitical tensions, or even a blockage, on the Arctic route. Internet cables, pipelines and land and underwater electricity cables in the Mediterranean are the subject of strong diplomatic tensions, following maintenance defects and malicious acts that lead to connectivity cuts. There are clear consequences in many sectors, such as energy, health, food security or monitoring and warning systems for natural disasters. Sectors that are highly dependent on connectivity are relocating, adapting to regular power and Internet outages with new tools, or setting up small-scale alternative energy sources (e.g. methanizers, private solar panels, mini hydroelectric power plants).

Technological sobriety is therefore the best and often the only option, in this context determined by urgency and infrastructure failure. The Mediterranean region is therefore characterised by low carbon emissions. Throughout the region, there is an abundance of simple and artisanal technologies, alongside more sophisticated risk reduction systems used by the wealthiest social groups (automatic remote fault detection, network optimisation via artificial intelligence, etc.).

Society and governance

Mediterranean lifestyles are gradually transformed. The aim is to deal with the most pressing problems in an attempt to recover from the consequences of chronic crises. This change in mindset is accompanied by a growing and widespread awareness of risks, but with little attention paid to prevention, and cooperation between communities and the management of common goods, such as the Mediterranean Sea.

States and local authorities refocus their efforts on disaster management and introducing increasingly stringent security measures. However, they are increasingly overwhelmed by the proliferation of crises and extreme events, and their inability to provide security exposes them to growing criticism, and their legitimacy is called into question, even leading to revolts and overthrows of power.

Mediterranean people must therefore adapt in order to survive, but these forced adaptations come at a heavy social cost and a decline in human rights. In the North, and particularly in European Union countries, social insurance and regional solidarity systems initially manage to absorb the shock of crises, but repetition gradually leads to budgetary capacities drying up and assistance mechanisms becoming paralysed. Private economic insurance systems, where they exist, refuse to insure against climate risks. More and more, in both the North and South, this has to be taken over by what remains of family, non-profits or local solidarity. The situation is therefore testing the resilience of local societies, communities and residents to shocks, which, paradoxically, are stronger in Southern than in Northern countries.

The vast majority of local populations are left to their own devices to adapt to the permanent state of emergency, or conversely are subjected to radical measures implemented by authoritarian powers in “fortress” areas. The region witnesses the rise of authoritarian, racist, xenophobic and nationalist regimes that are both a cause and a consequence of mass and disorganised migratory flows. Despite some vehement opposition from civil society, the populist authorities in power take unilateral measures to stem the flow of migrants by all means, with increased surveillance, militarisation of borders, creation of numerous internment camps and violent expulsions. Gender-based inequalities are exacerbated and sexist and sexual violence increases.

This situation is a breeding ground for the rise of sectarian groups. Social bonds are breaking down, and identity-driven categorisation is becoming an additional criterion for division. Religious affiliation is used as an instrument, either by advocating forced secularism in order to exclude certain specific groups, or conversely as a conditional criterion for belonging to society. Religion and ethnic identity are shown on identity documents in some regions, and become a pass to access certain areas and resources.

There is therefore an upsurge in racially motivated crimes and systemic discrimination that is increasingly accepted and normalised. Sporadic and violent revolts are used to express opposition, and protest movements become more radical.

But divergent voices are either inaudible in the face of constant crises and accumulating disasters, or they are stifled by responses that are hardening and becoming militarised. The culture of demonstrations and protests is entering a cycle of retaliation and vengeance that is getting worse.

Some energy-intensive sectors and those dependent on globalised trade disappear suddenly, leading to unemployment rates that exceed all projections. Initially, young people, especially those living in countries with the greatest difficulty in meeting their energy demand, are the first victims of these repeated crises, which widen the geographical and generational gaps. In the 2030s, while employment statistics still exist in the Mediterranean Basin, 150 million young people find themselves unemployed, most with qualifications unsuited to this context of chronic crisis. This “no future” generation is economically and civically isolated, and self-organises with sometimes violent protests. Human trafficking networks are growing as a means of cheap labour for unscrupulous economic actors. Employment and working conditions are deteriorating everywhere, especially for vulnerable and/or precarious people. In the North, legal frameworks for employment protection unravel gradually, making the lives of populations more precarious.

The rise in migration, the impoverishment of certain neighbourhoods and climatic conditions favourable to certain vectors of disease reinforce the spread of epidemics such as dengue fever, yellow fever and cholera. Antibiotic resistance also contributes to the emergence of new diseases and makes populations vulnerable to pre-known diseases. It impacts the biological capacity of inhabitants to survive epidemics that decimate certain neighbourhoods and cities, leaving them isolated, or conversely, provoke new mass exoduses that spread diseases. This situation does not just impact individuals’ physical health. The mental health of Mediterranean populations deteriorates as they go through crises. In the mid-2030s, the backlash from intensified crises is felt when the suicide rate in the region rises, contrary to past trends.

The rise of populism hinders weak efforts at cultural exchange. The Mediterranean cultural sector bears the brunt of the crisis and struggles to find the financial and human resources required for recovery. Many traditions once central to Mediterranean identity are lost, such as Mediterranean music and art, in the face of the break-up of diasporas. This consequent cultural loss contributes to the uprooting of Mediterranean societies and confirms a widespread feeling of total loss of bearings.

However, this catastrophic scenario sees the **emergence of new self-managed and more egalitarian community lifestyles**, in search of food autonomy, low-tech and nature-based solutions, ancestral know-how and solidarity systems. In the face of the despair and panic generated by the crises, some places implement decentralised management, start to apply resilience policies and invent new, more local and collective decision-making methods. Mutual aid systems are needed to counteract growing social insecurity and to try to strengthen social bonds. Energy shortages lead to the development of mechanical modes of transport (bicycles, animal transport), with a neutral carbon footprint. There is a sudden awareness of the preciousness of water, with the implementation of efficient water recovery systems (rainwater and wastewater recovery filtration systems). Market gardening, handicrafts and recycling gradually grow, accompanied by new forms of local and subsistence farming (permaculture). Forced adaptation once again opens the way to the traditional Mediterranean diet, which is more plant-based, and completely abandons ultra-processed products, along with a massive reduction in meat consumption (end of intensive livestock farming) and fish consumption (reserved exclusively for subsistence fishing). In organised communities, Mediterraneans find meaning in their work and a role in society, which are essential components for mental health that many Mediterraneans, especially in the North, have been seeking in vain for years. These new social dynamics begin to emerge in the late 2040s, but are far from the norm in a context that remains deeply marked by colliding crises.

Land and marine environment

As a logical consequence of the economic and political deterioration, the Mediterranean environment continues to decline. Water stress, combined with poor water management, is the starting point for a succession of crises in this scenario. After several years of severe droughts, more and more water tables are drying up or becoming saline. The water from these tables is becoming unfit for consumption and agricultural use. Dams are struggling to fill up at the start of the season, with adverse effects on irrigated agriculture, which used to ensure food security and a proportion of exports in several Mediterranean countries. Reduced flows are also drastically reducing the yields of hydroelectric plants. Soils are

depleted and become more vulnerable to aridity. The energy shortage prevents continuous operation of water pumps and desalination plants, making some places that depend on this infrastructure for their water supply uninhabitable. All Mediterranean countries are affected, although at varying levels, causing widespread water shortages and food insecurity. The situation also impacts the health of people and all ecosystems, along with the economic sectors dependent on water supply. This lack of water therefore generates numerous conflicts, limits human development and leads to certain tipping points being reached, such as for soil and systems rich in biodiversity like forests.

As with most public services, environmental policing activities are under-equipped and under-valued, which gives free rein to pollution and other environmental degradation caused by human activities. This is accompanied by a collapse in investments in, and the maintenance of, waste treatment and purification systems, which further increases the impacts linked to “new” risks. All these degradations affect environments that are often already weakened, which leads to the local collapse of ecosystem functions, and even the extinction of certain species. Some areas affected by extreme climate events (fires, floods, erosion) are deserted. Due to a lack of resources and willingness to rebuild, nature takes over. New “natural” areas are beginning to emerge in the remains of human activities.

Ecosystems are undergoing a profound structural transformation due to continuous changes related to climate change, acidification, pollution (such as plastics), and the gradual artificialisation of the maritime space. The endemic crisis also leads to the overexploitation of local marine resources that are still available. The Mediterranean monk seal (*Monachus monachus*) and bamboo coral (*Isidella elongata*) are considered as two species now extinct in the Mediterranean basin. Heat waves at sea are increasing and intensifying every year, causing the death of large underwater meadows of the endemic seagrass *Posidonia oceanica*, the vermetid reefs, and the coralligenous that are home to high levels of marine biodiversity.

Endemic species are increasingly competing with invasive tropical species, with large numbers migrating to the Mediterranean due to sea warming. International trade in endangered species is flourishing, such as in the Boundary Shark (*Carcharhinus limbatus*).

On land, the export of living resources linked to the economic situation (rare species, medicinal plants for pharmaceutical research, etc.) places additional pressure on Mediterranean biodiversity. Soil quality is strongly degraded because of chronic droughts and ongoing high pesticide use. This leads to a crisis in agricultural production, especially in the South. These environmental degradations weigh on the health of ecosystems, crops, livestock and people. In order to absorb the mass rural exodus due to the agricultural crises, cities are building new housing in a hurry, thus accentuating ground artificialisation and leading to a gradual decline of nature in the city. In summer, heat waves and air pollution make the urban environment difficult to live in, with significant consequences for human health. Overall, the Mediterranean of 2050 will have suffered a significant loss of biodiversity, and ecosystem processes will have been profoundly altered, resulting in a lower trophic level and the disappearance of certain fisheries. Despite this widespread depletion of biodiversity and the reduction of biomass, new ecosystems are emerging with species replacements and new productions in marine and land environments. Faced with a general acceleration in the mass collapse of biodiversity, national and international research bodies (universities, organisations like UNEP or IUCN) develop emergency measures to save what can still be saved, by creating species conservatories or concentrating on the protection of hotspots.

4. Assessment

In the 2020s, the Mediterranean must be prepared to deal with the major uncertainty linked to an increase in potentially catastrophic crises. This assumption only reinforces the urgent need for profound changes in lifestyles and systems of governance, in order to move towards sustainable development. This scenario proposes such changes, but they are totally involuntary. It is based on the assumption that the Mediterranean region is unable to prevent crises of all kinds, which occur and feed into one other at a speed that defies all predictions. The Mediterranean is in a situation of general breakdown and forced adaptations. The human, social, cultural, economic and environmental cost of this succession of crises is particularly high. While certain aspects of this scenario show a Mediterranean in 2050 that is collapsing, it also offers an opportunity to test the resilience and crisis response capacities of the various territories. This forced sobriety and adaptation reveal spaces on the margins where new relationships can be built between the Mediterranean people and their environment.

This scenario can be read in opposition to a resolutely proactive scenario in which the actors anticipate, i.e. reduce vulnerabilities, prevent risks, and build systems capable of absorbing certain shocks and responding effectively, including

by strengthening international cooperation. Clearly, an anticipated transition towards voluntary sobriety and greater resilience could be implemented at a much lower human, economic and environmental cost than this scenario, which has forced sobriety in the North and increased shortages in the South. This scenario may also raise questions about the collective capacity of regional stakeholders to initiate a transition in the absence of the impetus provided by the crises.

Scenario 3: Growth at all costs in a fragmented Mediterranean

1. Abstract

2050 - Climate and environmental signals have not been heeded. All nation states faced with the spectre of unemployment, recession, social explosion and excessive debt have been engaged in a frantic race to conquer new markets over the past several decades. International authorities have become ineffective, if not totally discredited. Economic growth remains the only *leitmotiv* in this multipolar yet disconnected world, where nationalist tensions are exacerbated. This is particularly the case in Southern countries, which are still in a phase of accelerated development, demographic growth and catching up with the economies of the North. Priority is given to employment, at the expense of the environment. Markets are the main driver of both partnership and competition between states, which fragments the Mediterranean as it is pulled by centrifugal forces. Each country seeks first and foremost to safeguard its own interests by forging partnerships of various sizes as opportunities arise. In this race to preserve societal balance, which is threatened by economic and social breakdown, environmental protection is still not a priority, unless it has a direct economic benefit. The local environment, global problems and, consequently, protection of the sea, are secondary to national concerns.

2. Dynamics and actors

Initial conditions for the scenario

The initial conditions for this scenario are based on various concomitant dynamics both at the international and Mediterranean levels. There are three acts:

- Act 1 - the end of solidarity: a lack of international cooperation and coordination has led to the loss of credibility of international governance institutions in the spheres of collective security, the fight against poverty, and the environment. The failure of climate negotiations and unfulfilled promises to finance climate change adaptation in the poorest countries have reinforced the policy of “every man for himself”, to the detriment of the environment. As a result of this lack of solidarity from rich countries, which are the main polluters and debtholders, many African and Asian countries decide to catch up by any means available to them... the continental split is now complete.
- Act 2 - pariahs’ revenge: the African continent experiences strong demographic growth (population doubled by 2050), which is driving global growth and offering opportunities to the Mediterranean, particularly through mass investments from countries in the BRICS+ coalition, which has been consolidated since the 2020s. The rise in power for BRICS+ has come at the expense of the European Union, which is disengaging from the Mediterranean and reducing Mediterranean cooperation targets to a minimum while it deals with its own regional integration problems and a rise in nationalism. The withdrawal of the United States, returning to a policy of protectionism, also helps create space, leaving room for other emerging powers in the Mediterranean (BRICS+, which are interested in establishing themselves economically in the Mediterranean). Generally speaking, there is a retreat from the model supported by the major democracies. Strong growth policies in the Southern and Eastern Mediterranean help improve employment and development conditions in the region. Thanks to investments in the health and education sectors, fertility rates begin to fall, strengthening development conditions in these countries.
- Act 3 - interested alliances: due to the lack of leadership with a common political vision and will from states converging towards solidarity and cooperation between Mediterranean countries, there has been no catalyst for coherent regional construction with long-term funding that could have initiated this construction. Faced with internal social problems, economic policies are devoted to growth at any cost to ensure a bare minimum of social peace. It is true that development has enabled Southern countries to catch up by the end of the period in terms of public and private water supply, purification and waste treatment services, but this is too

late and insufficient to reverse the effects of this choice. This trend is to the detriment of the health of ecosystems, with over-exploitation of resources and predation on the environment. As a result, there are massive and irreversible disruptions to the functions and productivity of ecosystems, and an increase in the number of environmental disasters, making the Mediterranean a fragile region that is particularly vulnerable to crises and extreme events.

Actors and associated stakeholders

In this scenario, stakeholders are impacted by a strong willingness from Mediterranean states to do everything in their power to create wealth by any means. In the South and East of the Mediterranean, they facilitate policies of rentier exploitation and large infrastructure projects with state-to-state partnerships based on national interests, offering advantageous tax conditions, especially to large corporations. States on the Northern shore of the Mediterranean are also forging advantageous partnerships based on the development of their key economic sectors and their efforts to adapt to globalisation. In the South, growth at any cost is driven by BRICS+, which are playing a driving role by forming alliances at the Mediterranean level and by promoting very strong integration with Africa. Large multinational firms (e.g. petrochemical, energy, pharmaceutical, digital and technology industries) also play a dominant role by making their investments contingent on public policies very favourable to them, particularly in terms of environmental and social regulations. At the supranational level, the role of international bodies is undermined by the rise of nationalism and bilateralism, which results in a major problem of governance, causing resolutions and other decisions at the international level to lack effectiveness. The European Union is also affected by this trend and is losing momentum on the international scene, with little political ambition at the Mediterranean level. Other stakeholders, such as civil society and NGOs, act in a dispersed manner without real cohesion. Their actions are limited when faced with authoritarian and/or nationalist powers. Social revolts and movements are violently repressed. Despite an improvement in living conditions, there are strong inequalities between and within countries. In some areas, the local authorities fill in the social gaps when state public policies are not sufficiently proactive and redistributive.

Different phases

An initial phase with a shift from the status quo (business-as-usual scenario) until the early 2030s when dynamics accelerate. States are unable to agree on the measures to adopt in order to counter the rise in global warming, and the funding needed for Southern countries, some of which are burdened with debt, to adapt their economies towards an ecological transition. Competition for access to resources is accelerating. Climate migration explodes across all continents. Migration policies become stricter, and in Europe, under the pressure of rising populism, highly conservative and xenophobic governments come to power in half of EU countries. These governments are unable to agree on policies, and tensions within and between European countries prevent the cogs of EU policy from turning. The Mediterranean neighbourhood policy suffers the consequences and is reduced to a trickle. At the same time, on the other side of the Atlantic, the United States suffers from the same climate constraints, with a mass influx of illegal migrants, and opts for very strict quota policies. Despite its considerable capacity for action and soft power, the United States returns to protectionist policies and focuses its actions on the Pacific (Indo-Pacific zone) in the face of an omnipotent China and other Asian countries (Japan, South Korea, India, etc.) that are very economically competitive. Moreover, the United States begins its ecological transition and no longer focuses its foreign policy as much on securing its sources of supply of black gold and gas in the Mediterranean and the Persian Gulf. Thanks to the technologies they have been able to acquire, they are also banking on deep-sea mining and offshore extraction to achieve energy independence. They lose interest in the Mediterranean and gradually abandon their “protégés” in the Gulf States. This new world order fuels rivalries intrinsic to the Mediterranean.

At the Mediterranean level, internal dynamics are underpinned by the political will of states to integrate into globalisation and to try to remove obstacles in order to overcome economic difficulties and avoid being marginalised from the global economy. Faced with structural problems in the Mediterranean, with uncompetitive economies, countries seek growth by any means in response to the current priority, which is the social emergency and employment. Growth is achieved by implementing national strategies, which differ between the North and the South. Nevertheless, one common feature of

this quest for growth across the Mediterranean is that it is initially at the expense of the environment, because it is expected that strong growth will eventually provide room for manoeuvre to finance future environmental expenditure.

In the second phase, the United States is no longer the world's only economic and political power. The dollar is facing competition from other currency systems, especially cryptocurrencies and "Bretton Woods III", based on gold and commodities, launched by Russia, China and countries in the Eurasian Economic Union to stabilise their currencies. All emerging countries and commodity-exporting countries have opted for this new Sino-Russian monetary system, which has led to a depreciation of the purchasing power of fiat moneys and high inflation in the Dollar and Euro zones. BRICS+ are now a major political and economic player, with many African, Latin American and Asian states joining them. In a dispersed manner, Mediterranean states, especially in the South and East, jump on the bandwagon formed by a coalition of states that have little regard for the political regimes in place, and that are leading them towards growth. Isolated economies emerge throughout the Mediterranean. However, some investments prove to be unprofitable and do not have all the desired long-term effects.

In the third phase, from the 2040s, this development model, based on a vision of short-term economic optimisation to the detriment of environmental protection, shows its limitations, despite socio-economic progress. Environmental degradation, the erosion of biodiversity and an increase in environmental disasters put a stop to this race for growth. The Mediterranean is then plunged into a cycle of economic recession and multiple crises with devastating effects on the living conditions of Mediterranean people and on ecosystems.

3. Scenario description

External context

In a context of nationalist isolationism and poorly regulated liberal globalisation, the global powers are engaged in an exacerbated economic war to ensure their sovereignty in the face of rival powers. However, in order to mitigate the recurrence of crises or to secure their economies while preserving their social, political and cultural specificities, some states join forces to form partnerships on the basis of both economic and geopolitical opportunities, such as BRICS+. The world is therefore now organised around multiple zones of influence (China, United States, etc.) and competing poles. In this context, the Mediterranean is pulled between centrifugal forces that push the various sub-regions of the Mediterranean area further apart, and prevail over efforts at intra-regional integration. This process leads to the fragmentation of the Mediterranean region, which is split between several areas, some extended beyond the Mediterranean (Turkish-speaking world, Sunni Middle East, Balkans, Northern and Southern Europe, etc.), which impose specific development policies and establish tailor-made cooperation (energy, education and training, digital technology). With reshaped alliances, based largely on economic interests, the Silk Roads play an important role, with a horizontal axis of cooperation running from China to North Africa, via Central Asia and the Middle East. Economic lobbies exert strong pressure, which, coupled with the inefficiency of international regulatory mechanisms, indirectly calls into question international conventions and ecological standards. Environmental priorities are increasingly abandoned and masked by greenwashing, except when they generate economic profit. In the search for economic growth, many countries continue to use fossil fuels, such as gas, especially in the South, in a context marked by geopolitical tensions and the need for energy sovereignty. Moreover, in the total absence of international coordination, stabilising CO₂ stock by the end of the century is out of reach. As a result, the world is heading towards warming of over 2°C by 2050. The Mediterranean is warming faster than other regions in the world, set to reach +2.5° by 2050.

Geopolitics and governance of the Mediterranean

The Mediterranean becomes the stage of a permanent game of strategic and circumstantial alliances, especially characterised by the intervention of new emerging powers (China, India, Saudi Arabia, Iran, Qatar, South Africa, etc.). These relations are essentially based on logics of power and economic domination, resulting in chronic and structural instability at the regional level, and fragmentation of the Mediterranean. Relations between Mediterranean states are based on cooperation of various forms and sizes, underpinned by occasionally fierce competition between these countries to attract foreign capital and establish trade agreements with emerging powers, the majority of which have joined the BRICS+ coalition.

The European Union is under fire due to internal nationalist tensions, demands led by separatist identity movements, and a rise in extremism movements that are spreading their ideas and gaining power in some key EU countries. It is no longer

able to find a stable compromise and is facing an unprecedented political crisis. Threatened by the risk of implosion and forced to operate at multiple speeds to plug the gaps and hold its structure together, it fails in its attempt to chart a new course of economic development (based on the Green Deal) and to become an autonomous global power. However, in the Mediterranean, it continues its neighbourhood policies as far as possible, essentially centred on bilateral economic cooperation.

The post-Ukraine war geopolitical context has opened a Pandora's box of territorial claims and has led to the breakdown of collective security mechanisms. Regional and global power struggles intensify in the Mediterranean, leading to tensions and conflicts related to unresolved territorial disputes. Exclusive Economic Zones (EEZs) claims are frozen and there is no clear mechanism to protect and preserve biodiversity beyond territorial waters. Efforts by international organisations are ineffective, as in the case of EcAp¹⁸, which is no longer enforced, resulting in major losses of biodiversity and resources, aggravated by climate change.

Demographics and regional planning

By 2050, the Mediterranean population will reach around 689 million inhabitants, i.e. an increase of 32% compared to 2020. However, demographic trends are contrasted depending on the Mediterranean sub-regions, with very significant increases in the South (+57%) and East (+41%), and relative stagnation in the North (+2%). Under the pressure of nationalism, migratory flows are strictly controlled and limited to functional economic or demographic needs, thanks in particular to the introduction of quotas for labour mobility in most Northern Mediterranean countries. However, strong growth policies in the South and East make it possible to contain the need for migration, thanks to job creation and the need to avoid a brain drain. Nevertheless, there is a mass increase in illegal migration, as a consequence of global warming, which is increasingly felt on the African continent and on the Southern and Eastern shores of the Mediterranean, along with the resurgence of localised territorial conflicts.

Cities absorbing these flows of migrant populations from overseas and a mass rural exodus in a fragmented Mediterranean Basin have been transformed into commodified city-states, over a large part of their territories. These city-states are subject to neo-liberal or rentier logics of property speculation and transit, and are controlled by powerful private financial networks. In these global and uniform cities, where a small proportion of the population captures all the income, an increase in inequalities is expressed geographically in a segregation between the city centre, the inner suburbs and the outer suburbs. Cities in the Southern Mediterranean are no exception, with an acceleration of the urban transition and rates of urbanisation and metropolisation rates comparable to the North.

Like cities, the coastline is now almost totally artificial, with some protected enclaves reserved for an elite. It faces strong pressure on land use, with the chaotic pursuit of growth in activities and infrastructure, especially around large tourist, industrial, energy and property projects, such as the construction of marinas or cruise ports, secondary residences, tourist real estate, hotels, amusement parks, and offshore wind farms. Faced with lobbies linked to the commodification of land use planning and the prevalence of mafia-type organisations, planning regulations to preserve the sustainability of the coastline are simply not enforced. The coastline is retreating significantly, especially because the Barcelona Convention ICZM Protocol and the rules at its core are not enforced. High environmental risks, especially related to climate change, are managed through technology and mass private investment in large and costly infrastructure (e.g. sea walls, salt water recycling solutions, desalination plants) in regions that have the capacity to do so. Territories in countries that have not been able to adapt to this rise in water levels are simply abandoned, with the inhabitants of these areas swelling the population of large cities and climate migration flows.

Economy and development policy

¹⁸ EcAp: The Ecosystem Approach (EcAp) is a strategy for the sustainable and integrated management of resources (living resources, soil, water, etc.) implemented by UNEP/MAP to achieve good ecological status for the Mediterranean Sea.

The economy naturally plays a central role in this scenario. This is primarily due to the international context in which the global economic system has not initiated any major paradigm shift and considers economic growth and wealth accumulation as the ultimate goal to be pursued. Despite recurring crises, this necessity remains unavoidable at the global level, especially in developing countries after the failures of climate negotiations and unfulfilled promises to finance adaptation to the effects of climate change in the poorest countries. Giving continued priority to the economy is justified above all by the need to meet immediate development and job creation needs, particularly in Southern and Eastern Mediterranean countries, within a context of strong demographic growth and the arrival of many young people on the labour market. It is also a matter of tackling the risks of economic marginalisation and loss of competitiveness of the Mediterranean economy, including in the North. In the absence of an alternative model to the market economy, economic growth at any cost, based on the immediate maximisation of gains and opportunities in all directions, is imposed on the Mediterranean. Driven by major economic players (nation states, multinationals, private companies, large private and public banks, etc.), it is reflected at the territorial level by the spread of poorly regulated, often informal activities, with the development of self-employment, the outsourcing of jobs and parallel markets. At the same time, everything is done to attract international capital, even if this means lowering taxes and opening up the possibility for external firms to exploit local resources. The Silk Roads, China's monumental project for the 2020s, has paved the way for the conquest of new markets in Africa and the Middle East, and initiated competition between economic powers to seize resources.

The economy in the various Mediterranean regions is still mainly based on rentier capitalism, through tourism, property, oil and mineral resources (phosphate, etc.), some speciality agriculture, and on the development of traditional activities (maritime transport, crafts, etc.). However, each country develops proactive and specific strategies for diversification and targeted protection of its economy, paying attention to all new market opportunities, including in the digital and energy sectors, specialising depending on the comparative advantages (labour costs, resources, geography and climate, infrastructure, diasporas, quality of life, etc.). Development is centred on rentier exports, infrastructure construction and the development of niches in the new technologies sector (solar, hydrogen, digital platforms, etc.). These are mainly isolated economies with strong territorial inequalities.

Refocusing on comparative advantages also affects the agricultural sector, with the development of export agriculture and confidence in the world market to meet food needs.

The industrial sector, especially high-tech (chemicals, pharmaceuticals, aeronautics, arms), remains essential to the economic development of Northern Mediterranean countries. However, this sector has undergone significant restructuring - some of which has helped to rebalance industrial growth between North and South. Some very workforce-intensive sectors of the manufacturing industry, which have become unprofitable and less productive on the Northern shore, are abandoned or relocated, such as the construction of cars with internal combustion engines, which is transferred to the Southern Mediterranean en masse, after the EU prohibits their sale in 2035.

Mediterranean countries are in fierce competition for economic partnerships, which leads to strong instability and sometimes conflicts over resources, including water, which has become a scarce resource. Countries and large cities with strong economic potential and relative stability, particularly in the SEMCs, attract capital and benefit from growth. Their wealthy middle classes fuel the development of new forms of consumption, and therefore new activities that increase the ecological footprint of these societies/countries. Other territories are marginalised and sink into poverty. Plunged into an economic slump, they suffer from severe food crises affecting the most vulnerable fringes of society. Revolts break out, fuelling extremist movements and causing strong repercussions on internal political stability, sometimes even leading to civil war. These abandoned countries or regions depend on humanitarian aid to meet the basic needs of their populations (food, healthcare, drinking water, etc.).

Without market regulation from states, and due to the lack of cooperation to establish common indicators of sustainability and waste reduction, goods and commodities are not produced in environmentally-friendly ways and continue to produce a lot of waste which feeds a recycling market that generates economic profit. In some countries, there is a revival of the mining industry (hydrocarbons, rare-earth elements, etc.). There is widespread development of offshore wind projects, desalination activities and deep-sea mining and gas production in EU countries and the Northern shores of the Mediterranean, but this is more disparate in Southern countries, with some large investments in the renewable energy sectors. Hydrocarbons still account for 70% of the energy mix, despite an energy transition initiated in the North with an increase in the share of renewable energies and nuclear power. Primary energy needs are increasing, with the proportion doubling on the Southern shore in the space of 30 years. The renewable energy sector (solar, wind, etc.) grows to reach 17% of total energy demand by 2050. Building on restructuring linked to the war in Ukraine, Southern and Eastern

countries pursue oil and gas exploration, with significant carbon lock-in by hydrocarbon producers. Some countries whose economies are linked to fossil fuels sit on both sides of the fence. They export hydrocarbons to African countries where demand has risen sharply, and solar energy to countries in the North that have made progress in decarbonising their economies.

Green financing opportunities have significantly expanded, but their accessibility depends on the profitability of projects, the attractiveness of countries or regions, and the environmental issues at stake. Large, profitable projects are favoured. Consequently, there are strong geographical disparities depending on the stability of countries, geopolitics, and their guarantee and insurance systems.

The development of a sustainable blue economy remains generally uneven and slow, due to the lack of cooperation and coordination on major collective issues such as the decarbonisation of the economy, including maritime transport. It is limited to activities likely to generate immediate economic gains (exploitation of marine resources, tourism, maritime transport, etc.). In a context of widespread competition between Mediterranean countries, port networks compete in the race for international transshipment traffic. China, with its policy of influence in support of the economic development of the “Silk Roads”, takes control of a growing number of strategic Mediterranean ports in order to enhance its production and services. These ports benefit from this climate of competitive investment between major powers.

Following a period of strong support for fishing activities in the 2020s and 2030s, they are in rapid decline and replaced by aquaculture. The rise of sea temperatures, pollution and overfishing, as a result of the deregulation of standards and monitoring systems, have undermined the efforts made since the 2010s for concerted management adapted to each type of fishing. Due to a lack of coordination between nation states, some of which are permissive, and despite increasingly sophisticated monitoring systems, illegal, unreported and unregulated fishing reaches record levels (35%). In the face of this lack of governance, incursions by fishermen into Marine Protected Areas become more common. These areas find it increasingly difficult to maintain healthy ecosystems. Despite many constraints (increasing pressure on freshwater availability, various forms of pollution, conflicts of use in an already highly coveted coastal zone), aquaculture performs well (3 Mt vs. 2 Mt in 2016) and continues to develop, but in a more opportunistic than planned manner. From 2030 onwards, the fisheries market is drastically transformed. This is due to the climate of insecurity in the aquatic products supply chain, and growing consumer mistrust linked to repeated scandals especially related to pollution and fish feed. Seafood products are gradually replaced by “fake fish” reconstituted from various components and molecules derived from biotechnologies, with high added value, manufactured by the agri-food industry, which has found a promising new source of income in SeafoodTech.

After the collapse linked to the COVID crisis, all countries reinvest in tourism, first in the North, then progressively in the South, which invests major efforts to increase the safety of travel and trips. After 2030-2035, with less favourable climate conditions and pollution likely to dissuade some tourists from certain Mediterranean destinations, operators and large private groups make mass investments in order to make some sites more attractive. They adapt their offer towards leisure activities that incorporate various sophisticated activities and entertainment by creating new sites and cities designed to reproduce the glory years of Mediterranean history and civilisations¹⁹. This concept of “Famous MED Tour” spots involves cruise companies, which plan visits to these sites during organised stopovers. Large hotel groups also diversify their offer by adapting it to wealthier customers during the low season. They privatise unspoilt coastal enclaves and extend reclaimed land areas into the sea with the help of major infrastructure. New technologies are also developed to help preserve bathing areas for these high-end tourists, with high-precision sea-cleaning robots that capture plastic waste and invasive species such as toxic algae and jellyfish, whose numbers have increased exponentially. When there is a profit to be made in the tourism sector, some investments improve the quality of the land and marine environment, while some poorly adapted solutions are also put in place. For example, some fashionable beaches are equipped with air coolers fitted with solar sensors, creating a dome-shaped screen of invisible waves, protecting against UV rays and providing air conditioning. Finally, in order to ensure the survival of the tourism sector, especially mass tourism, many countries finally bow to pressure from tourism lobbies and adapt school holiday periods in line with rising temperatures.

¹⁹ Sites imitate Luxor at the time of Ramesses II; Athens under Pericles; Rome under Augustus; Pompeii before the eruption; Damascus at the time of the Umayyads; Rome, Florence and Venice during the Renaissance; Istanbul under the Ottoman sultans; etc. They also draw inspiration from Mediterranean ecosystems, traditional rural areas, and famous battlefields (Troy, Thermopylae, etc.).

Science and Technology

Research and innovation are the main drivers of growth in the industry and technology sector, for the development of civil and military processes with a high economic potential that can be quickly exploited on the market. Research and development in emerging technologies is leading to global advances in areas such as quantum computing, artificial intelligence and biotechnology. But given the delays in research and the lack of cooperation that characterises this scenario, individual countries do not have the capacity to invest in all these fields at once, and must choose their “niche” depending on their direct economic needs. Caught up in global competition and often confronted with a drop in public spending on research and innovation in their countries, Mediterranean universities are increasingly required to develop partnerships with private and industrial players who are part of competitiveness clusters and specialised clusters. These networks of universities and clusters focused on technosciences are built on economic partnerships and national specialisations. These collaborations are supported by nation states, which facilitate these agreements by developing protective customs policies and favourable tax measures. The creation of new startups, including in some cleantech sectors, multiplies with the support of stock market mechanisms to support innovation. Public investment in research, particularly in Northern Mediterranean countries, is focused on local needs not covered by private research.

Digital technologies are the targets of fierce global competition, with the rise of China and India competing with the United States’ monopoly in this field. These countries forge partnerships with Mediterranean universities that specialise in high-tech and digitalisation, and adaptation to local markets. But despite their power strategy, no single country has the capacity to impose its standards on these economic giants. Surveillance capitalism hits its peak, with the commodification of personal data. The digital economy develops to the detriment of freedoms in many Mediterranean countries, sometimes going as far as the implementation of massive population surveillance systems in some countries (widespread use of video surveillance, police equipped with miniature drones with facial recognition that patrol the streets, etc.). It also comes at the expense of security, with a sharp rise in cyberattacks and cybercrime.

Marine observation and surveillance systems, which have become very powerful, were first developed to gain knowledge of marine ecosystems (e.g. digital twins), but in the long term they have proven to be a double-edged sword. When used for commercial purposes, they add to pressure on species and ecosystems. The knowledge acquired enables **intensive exploitation of the seabed**, which benefits the mining and biotechnology industries, in the search for new molecules, especially for use in the pharmaceutical and cosmetics industries.

Society

Growth has had the expected positive effects, particularly in terms of employment. Unemployment rates have fallen substantially, although there are disparities between countries in terms of economic performance and reforms undertaken, particularly in the education and training sector. There are also significant differences between regions within individual countries, due to redistribution policies and solidarity systems organised by nation states. These inequalities persist because states apply taxes that favour large companies and capital, in order to attract foreign investments. Few states initially implement proactive and ambitious policies for wealth redistribution. In countries where the state plays a minimal role in welfare, local authorities and/or charities take over to bridge the gaps of the social divide. Growth has also led to the development of a middle class in the South and East of the Mediterranean, which promotes the consumption of goods and services, thus contributing to the development of domestic markets. As growth continues, informal employment gradually declines, which increases tax income and ensures a better balance between the exemption of capital from taxation and the financing of public services.

Benefiting from an upturn in the labour market, young people and women are the main beneficiaries of better access to employment, especially in cities. Public-private funded education and training mean that education and training programmes gradually align with the needs of the labour market and employers. Young people from the South choose to migrate to the North to work in the personal services, health, tourism and new technologies sectors, but fewer of them make this choice than in previous decades, between 1990 and 2030. Despite improved employment opportunities, the younger generation chooses not to get involved in the social and political spheres, thus widening the generational gap. This withdrawal from public affairs is a form of resignation on a global scale by a “no future” generation, in the face of most states abandoning the fight against climate change and making unsustainable environmental choices. To escape the reality of a society they consider corrupt, these young people in need of hope create new communities by taking refuge in the virtual worlds of the metaverse.

The social status of women has undergone significant changes, particularly in the SEMCs, with increased access to employment (over 25% employment rate for women) and changes in family structures. However, these developments are not without clashes with the dominant patriarchal model, which is still very prevalent in Mediterranean societies. Their sectors of activity are still quite specific and traditional in the fields of care, where they play an essential role in ageing societies, education and public services. Nevertheless, there is definite progress in the science and technology sectors, entrepreneurship and trade. Women's employment in the digital sector is growing in Southern Mediterranean countries, thanks to investment in education and training, which are increasingly aligned with changes in the job market. In the North, as well as in the South and East, the gender pay gap remains significant in a large number of sectors. In general, after making progress in the 2020s and 2030s, the discourse on gender equality has stagnated as a result of blurred feminist messages, which have also been seized by nationalist and identity-based movements.

Growth at any cost has not eliminated social tensions caused by modernity in Southern and Eastern Mediterranean countries. The Western model still causes tension, and sometimes rejection, with a socio-cultural split between Westernised elites integrated into globalisation, the middle classes in an in-between situation with a kind of build-your-own identity, and the rest of the population, the majority of whom are attached to traditional values with a strong religious element that structures their way of life. In the North, individualistic and hedonistic values prevail, with a strong rise in populism and xenophobia. Nationalists hostile to any immigration hinder cooperation and cultural exchanges between countries. These identity-based aspirations maintain cultural and religious divisions between Mediterranean countries.

Throughout the Mediterranean basin, the traditional rural world is marginalised and dismantled, with a progressive abandonment of its social structures, culture and practices. Faced with climate change, water stress, soil degradation and the correlated food insecurity, there is a mass rural exodus in the South and East Mediterranean.

Governance

At the Mediterranean level, governance is marked by the deterioration of policy coordination within and between countries in a context of growing differences between regions and countries in each Mediterranean area. Paradoxically, there is an overall democratic decline throughout the Mediterranean, as employment and security are the main aspirations of societies, sometimes to the detriment of freedom. In Europe, populist and nationalist parties occasionally come to power. Environmentalist and anti-capitalist protests decline in the face of latent authoritarianism and the benefits of growth that maintain the myth of an affluent society. Some power is delegated to the private sector and experts who rely on economic assessment tools. As a result, in the East and South Mediterranean, the democratic model is no longer a cure-all. After recovering from the Arab Springs, which brought nothing but disillusionment and the collapse of public services, and without support from Europe, these countries engage in a race for excessive growth and turn to the Chinese rather than the European political model, based on submission to order and the deprivation of freedoms. Freedoms are therefore restricted and information is placed under guardianship. Misinformation on online media, which use artificial intelligence mechanisms to produce and disseminate information, makes them very unreliable. Under the pretext of fighting terrorism or plots against the state, some states develop highly sophisticated surveillance systems, a sort of "Mukhabarat in the digital age", which monitor people even in the private sphere. Despite this tendency towards authoritarianism, civil society plays a controversial and heterogeneous role depending on the country, but manages to make itself heard. It does so especially through social media, but often in a confused manner, with a number of pressure groups whose objectives and representativeness are often unclear. These constant controversies weaken the credibility of their positions.

One of the consequences of the collapse of democratic debate is the difficulty in finding acceptable compromises on how to use the fruits of this growth. This includes the taxation of individuals and corporations, the allocation of budgets, the level of social redistribution and decentralisation, and the choice of priorities. In a weakened political context, opaque methods, interest and other groups, and supply rationales taken even greater precedence over transparency and fairly meeting social demands and responding to emergencies.

Land and marine environment

Although environmental and climate awareness has not disappeared in Europe, measures to tackle climate change and other environmental problems are no longer a priority, except when they represent an economic opportunity. “End of the month” comes before “end of the world”, and in the context of inflation and latent crisis, everyone now feels that the efforts required to make the necessary ecological transition come at too great a social and economic cost with no guaranteed effectiveness. Europe’s ambitious mitigation policies are sharply scaled back, especially as past results have been very disappointing. Due to a lack of sustained cooperation, neighbouring countries have not taken serious steps to reduce their respective GHG emissions. The pace of reduction is aligned with the investments that private actors are willing to make. The European Union, also weakened by the rise of populism and nationalism, finds itself unable to truly steer environmental policies at the European and regional levels. This situation is combined with the pursuit of targets for growth strategies and very strong pressure from economic lobbies, which have resulted in some international conventions and ecological standards being overturned and environmental priorities being abandoned.

In the Southern and Eastern parts of the Mediterranean, the trade-off between growth and the environment (or the fight against climate change) is even more unfavourable to the environment. The argument is that the responsibility lies with the former developed countries and that there is not enough room for manoeuvre to engage significant efforts. Only the economic consequences that climate change could cause, such as on farms (development of crops that are more resilient to environmental change, precision farming aided by digital technologies, GMOs), or major risks for certain populations or ecosystems are taken into account. To meet the needs of urban populations who demand better living conditions after this growth, local waste treatment and purification capacities increase significantly in Southern countries at the end of the period, but their impact remains limited on this scale. There is no official backtracking on legislation or commitments, but neither is enforced.

Under these conditions, marine ecosystems and biodiversity undergo structural transformation due to mass disruption (habitat loss and degradation, pollution, litter and eutrophication), as a result of climate change and anthropogenic activities, such as cadastralisation of the sea and intensive deep-sea mining, desalination, offshore energy production, and oil and gas exploration. The presence of non-indigenous species has increased significantly, while the presence of native species and other vulnerable species has declined (over 5,000 species). Most reserves are fully exploited or overexploited, and fish stocks are heavily impacted (75% of fish stocks are overexploited). Due to a lack of resources and sufficient interest, MPAs are not managed effectively and measures to preserve species are neither effective nor efficient.

As with the sea, the conservation of land biodiversity is not a priority compared to economic challenges, except in a few protected enclaves. Resources are intensively exploited to supply the market with consumer goods. Forest areas are in sharp decline. Increased heat stress and droughts limit forest growth, weakening trees, increasing dieback and making them more vulnerable to pests and pathogens. Mega-fires, mainly linked to long periods of drought, are increasing throughout the region. Without regional cooperation and the resources to tackle them in some countries, they last for weeks, causing inestimable damage, sometimes threatening entire towns.

Despite major investments in water transfer infrastructure and the irrigation of agricultural land, water stress affects all Mediterranean countries. This scarce resource has become a crucial issue. It is a source of conflict, with water wars within states and between neighbouring states, particularly due to the multiplication of large dams, which also result in changes to sub-regional ecosystems.

From the 2040s, the consequences of the destruction of biodiversity, the artificialisation of land and landscapes and pressure on water resources will be drastic, leading to a drop in agricultural productivity, an increase in natural disasters (deforestation and landslides) and the emergence of zoonotic diseases. In general, ecosystems become less diverse, less stable and increasingly vulnerable to environmental change, sometimes to the point of collapse. By 2050, the Mediterranean environment will have been severely degraded, having already undergone irreversible changes with detrimental effects on all Mediterranean countries, which will have to take urgent adaptation measures.

This scenario may seem unrealistic in the current ecological context. However, the quest for strong growth, even at any cost, remains a very important political priority, obviously in Southern countries, but also in Northern countries, which means that this scenario remains entirely plausible.

The plausibility of this scenario also rests on the perception of weak signals that may tip the balance of the current equilibrium over the next 30 years, particularly for international governance and the place of the European Union as it strives to meet the challenges of its internal cohesion. BRICS+ states can fill the gap in international governance, by providing more economic rather than political leadership, and above all, through a relaxed capitalism that pays little attention to the environment or the climate, and that disregards the nature of the political regimes in place when entering into contracts. The success of these countries could also inspire and provide a “tailor-made” development model for some Mediterranean states.

However, this scenario has its limitations, as it is essentially based on the exploitation of resources and does not take into account the environment, except according to a short-term economic rationale, and also fails to consider the consequences of resource depletion and the carrying capacities of ecosystems. In this scenario, the Mediterranean has not resolved the contradictions between economic development and the preservation of critical resources such as water and soil. Following the path of growth at any cost proves to be a dead end. After a period of economic boom, the boomerang effects of environmental destruction are a reminder that the externalities of economic growth at any cost can prove to be severe and untenable in the long term.

Scenario 4: Euro-Mediterranean partnership for a blue-green transition

1. Abstract

By 2050, the Euro-Mediterranean partnership will have significantly altered the regional landscape, helped achieve carbon neutrality in the majority of countries, and ensured that the region is well integrated into globalisation. Strong regional cooperation, leading to the establishment of a common economic market based on technological and digital innovations, will have been established between Northern, Southern and Eastern Mediterranean countries. The European Union will have extended its Green Deal model to Southern and Eastern Mediterranean countries, based on a concept of sustainable development that attempts to combine economy and ecology. Having learned lessons from the failure of unilateral or bilateral responses to crises, whether health, political or environmental in nature, Mediterranean countries work to build a strong partnership across the Euro-Mediterranean region. The strategy to achieve this is the implementation of a blue-green transition at every level, based on technology and economic incentives. This transition is driven by heavy investments in digital technologies, the blue economy, and the energy transition, after a slow increase in awareness and political and social unrest. It is based on techno-scientific progress in a market economy, but is not unanimously accepted and is not without perverse effects.

2. Dynamics and actors

The road to the concrete implementation of the new Euro-Mediterranean partnership involves slow progress, controversies and setbacks, before being recognised as a success by most people. First, in the 2020s, the strategic decision of the EU to develop a common economic and technological market with the Southern and Eastern Mediterranean is not immediately accepted by all. In Europe, there is opposition demanding the Union to focus on its internal issues. Battles of ideas take place with every decision and step forward in this new partnership. In Southern and Eastern Mediterranean countries, there are also concerns about the partnership, which has been proposed by countries in the North, with a fear that it will be unequal and only benefit the EU. Finally, the billions of Euros needed to make the partnership a reality scare politicians, who are mostly sceptical, and have no guarantee that their investments will pay off. In addition, certain lobbies, particularly those associated with intensive agriculture and fossil fuels, play a major role in opposing this partnership and delay political decision-making. However, Mediterranean societies desire collaboration and push for the partnership to happen and involve all layers of the population. After several years of turbulence and the rise of nationalism in a number of states, the start of the 2030s sees the first major cooperation projects between Northern, Southern and Eastern Mediterranean countries bear fruit and tensions eased. Those who defend the Mediterranean New Deal also iterate the argument of the ageing population in the North, which requires a long-term Mediterranean-wide strategy in order to maintain the productive dynamics of Mediterranean countries.

Initial conditions for the scenario

This scenario is possible if the EU shows strong leadership to push for this new Euro-Mediterranean partnership. The EU also needs the support of several large countries to carry the vision of a transition based on digital and other technologies, and convince other countries to commit to it in order to relaunch the Mediterranean region as a major geopolitical and economic player. The European Green Deal must prove itself in order to be presented as a model to be adopted and extended to Southern and Eastern Mediterranean countries. In a climate of increasing major environmental and climate change, the Mediterranean New Deal needs to include strong mitigation and adaptation policies, particularly in Southern and Eastern Mediterranean countries, in order to be coherent and offer concrete ways to help these countries implement these policies (including through massive financial transfers, public compensation for damage, etc.).

Actors and associated stakeholders

States play a strong role in this scenario, particularly within the Mediterranean Alliance. They are the ones who adopt the decisions proposed by the Alliance, and who are responsible for implementing them at national and local levels.

The EU is the real leader in this scenario. It leads the Euro-Mediterranean partnership, which it sees as an extension of the Green Deal model.

Transnational corporations dominating the technology and innovations market have a strong role and considerable power

in this scenario. They are the ones who benefit from the digital and technological shift, offering the new tools and innovative solutions needed for the energy transition, or the implementation of increased digital-based environmental monitoring, for instance.

Civil society is strongly divided between representatives of civil society considered as integrated and legitimate on the one hand (those who sit in the Alliance), such as representatives of NGOs and recognised associations, and on the other, broader civil society not represented in the institutions, which expresses its disagreement with the digital and technological shift. This civil society makes itself heard through demonstrations and protest marches. It organises its own conferences and meetings. Its leaders point to a rise in inequalities within Mediterranean countries, especially between those with access to new technologies and the related jobs, and others people who are less qualified or living in less urbanised areas.

Different phases

Between 2020 and 2030, people gradually become aware of the issues related to climate and environmental change. Large international conferences are still organised, followed by the launch of green and blue initiatives, but states do not launch any large-scale joint projects to change the model. After several large-scale crises, non-state actors such as non-governmental organisations, activist groups and insurance companies, hit hard by repeated natural disasters and the destruction of infrastructure, sound the alarm to initiate large-scale changes. Governments take note and for both economic and social reasons, agree that things cannot continue this way. In the meantime, there is increased *ad hoc* cooperation on major projects.

In the 2030s and 2040s, new, more ambitious policies are implemented. The strategy adopted by the EU and Mediterranean states, after meeting several times to establish a new basis for cooperation, is to invest heavily in digital and new technologies, in order to start a transition to a more sustainable economic and social model. All sectors of the economy are affected, and must be redesigned and restructured with a view to better risk management and a stricter sustainability agenda. This requires, for example, the relocation of large infrastructure in coastal areas, which is extremely costly. Infighting takes place between actors who want to force the decarbonisation of the economy. The transition is conceived on a Mediterranean scale, in collaboration with all the countries, but the Northern states are still dominant and more advanced when it comes to sustainability. Many technologies that emit fewer greenhouse gases already exist in the North, and are therefore spreading more rapidly. Several years are needed for the transfers from the North to the Southern and Eastern parts of the region to take place. As time goes by, these technologies are increasingly integrated into the economies of Southern and Eastern Mediterranean countries, and the partnership becomes more equal. The methods on which the partnership is based change: there is a shift from project planning to a more flexible sector-based mode of cooperation, like the smart economy, as investment efforts are supported through the use of economic instruments.

In the last decade up to 2050, efforts start to pay off. Technologies have been developed in the South and East, creating job opportunities, especially for young people, who migrate less from their home countries to the North. The housing and transportation sectors gradually cut their greenhouse gas emissions, with the help of green and blue technologies. However, the promises of global hyper-technologicalisation are held back because it remains very energy-intensive, requires lots of scarce resources, heavy investments, produces technological waste that is difficult to treat and creates significant social inequalities.

3. Scenario description

External context

By 2050, global temperatures will have risen by 1.7 degrees, and by 2 degrees in the Mediterranean. With a few exceptions, carbon neutrality will be achieved or close to being achieved by 2050 in the Mediterranean. However, this is not without its problems. An initial phase of strong environmental degradation takes place (forest fires, floods, etc.). As a

result, there is increasing social pressure calling for a Mediterranean-wide political awakening. Governments recognise this and organise an extraordinary Euro-Mediterranean forum. The idea of creating a Mediterranean common market emerges from this forum. The European Union, which has been implementing a “Green New Deal” at its own scale, takes the lead in this organisation. The success of the Green Deal gives it a certain legitimacy as it has progressively achieved all its carbon neutrality goals while maintaining strong growth and a sustained level of innovation. The EU is a model of successful transition. Within this new Euro-Mediterranean partnership, it highlights the economic opportunities that the transition offers for the entire region and the need to invest in and disseminate new digital technologies. Both state actors and economic actors are invited to the negotiating table for this partnership. Transnational corporations and non-government actors such as the Big Five tech giants play a leading role in the emerging “World 4.0”. In a context where the effectiveness and legitimacy of national and international institutional powers are being questioned, global governance is increasingly structured around coalitions of interests or projects that bring together NGOs, foundations, local authorities, community networks and the media, under the growing influence of digital multinationals. At the same time, the transition to “World 4.0” is accelerating with the application of artificial intelligence, big data, robotisation, 3D technologies (“additive manufacturing”), the blockchain and the bioeconomy, etc. At the global level, states are guided by the European Union and its Green Deal model. They meet several times, notably at COP (Conference of the Parties) meetings, to define the ecological limits much more clearly. More measures, regulatory standards, economic incentives and evaluation methods are being put in place through advanced technological tools, and legislation is being tightened.

The war in Ukraine has resulted in the withdrawal of Russian forces, a diplomatic settlement and the prosecution of war criminals at international courts. The European Union remained united in the crisis and is playing a major role in the legal and diplomatic resolution of the conflict. International law and justice have emerged much stronger from this crisis, even though they had been challenged since the early 2000s by the rise of several authoritarian states. A geopolitical context that is more conducive to resolving conflicts through diplomacy is therefore taking shape.

Geopolitics and governance of the Mediterranean

This context, alongside the influence of European diplomacy, helps bring peace to several internal conflicts in the Mediterranean. This makes it possible for stronger cooperation between the European Union and Southern and Eastern Mediterranean countries. This cooperation focuses on key aspects of environmental protection and sustainable development. The EU, which has strengthened its global political and economic power, plays a major leadership role in the negotiations.

The EU implements a new and ambitious strategy to help make the Mediterranean Basin a space of dialogue, trade and cooperation, guaranteeing peace, stability and prosperity. It aims to help Southern and Eastern Mediterranean countries more effectively as they face institutional and structural dysfunctions, by drawing inspiration from countries that have succeeded in their transition, in order to disseminate these successful examples. The EU strategy has several stated objectives: 1) human development, good governance and the rule of law; 2) improving resilience, building prosperity and the digital transition; 3) peace and security; 4) open borders (including for migration) and mobility of people, knowledge and capital; 5) green and blue transition: climate resilience, new energies and the environment.

The new Euro-Mediterranean partnership proposed by the EU is called the “Mediterranean New Deal”. Since its launch, the signatory countries meet every year at “Med COP” meetings, in order to report on the progress of cooperation projects in the Mediterranean and define the priorities for the coming years. The partnership is a source of opposition and debate between and within countries. Some Southern countries see it as a form of interference by the EU and Northern countries, while some Northern Mediterranean countries refuse to invest so much money in this policy. However, after several years of controversy and slow progress, the partnership experiences success and allows the Mediterranean region to (re)position itself on a global scale as a major geopolitical player, acting as a bridge between Europe and Africa. At the same time, some countries in the East and South Mediterranean are taking full advantage of partnership with the Union. Thanks to proactive economic policies aimed at developing competitive businesses in the field of transition, supported by substantial investment from the EU, they are succeeding in boosting their economies and establishing themselves in the global economy. After the Asian “dragons” and “tigers”, there is now talk of the emergence of Mediterranean “eagles”. New prosperity in the region supports peace-building.

Regional governance

Building on the foundations laid by previous governance bodies set up in the Euro-Mediterranean Basin, the countries in the partnership decide to set up a new governance body: the Mediterranean Alliance. This Alliance is based on multi-scale and multi-stakeholder governance (especially of the sea) and comprises governmental and non-governmental bodies. Priority is given to law enforcement.

Not all Mediterranean states join this institution from the outset. Only a few countries are involved at the start, but this increases as projects are established and more and more successes are had, particularly for some states committed to the partnership very early on which have seen their economies grow thanks to trade with Europe, and the majority of Mediterranean states become signatories and participate in the Alliance.

With regard to maritime governance in particular, the Mediterranean Alliance chooses to reduce international waters, so that all economic activities fall under the jurisdiction of a coastal state that complies with IMO regulations. A common regional framework is developed to ensure effective environmental monitoring in the Mediterranean. State agencies or *ad hoc* international committees are in charge of this, relying on private operators who design highly sophisticated observation and monitoring tools. These private actors therefore have a central role and strong influence in this new system.

Demographics and regional planning

When it comes to demographics, the gap slowly widens between Northern and Southern and Eastern Mediterranean countries, following a business-as-usual curve. The population reaches 634 million in 2050. Compared to 2020, it has increased strongly in the South and East, and decreased slightly in the North. Overall, the Mediterranean population is ageing.

There is still strong legal migration between Southern and Eastern Mediterranean countries and Europe (which is mainly linked to socio-economic instability in these countries), but it is better managed, thanks to better cooperation with the EU. In the North, the legal arrival of foreign populations, particularly for economic or demographic reasons, is better perceived, and resettlement takes place under better conditions, particularly thanks to the regional cooperation agreement on migration signed in the early 2030s, at Med-COP 7. However, illegal migration persists. New surveillance methods, based on new technologies such as drones, are put in place to try to control it. Migration from Sub-Saharan Africa is still high and the subject of heated debate between Southern and Northern Mediterranean countries. The EU makes no provisions for this in the Euro-Mediterranean partnership.

The phenomenon of the “brain drain”, caused mainly by a lack of job opportunities for young graduates from Southern and Eastern countries, is gradually subsiding. Southern states decide to invest in relations with their diaspora, by creating a dedicated government body, based on the same model as India or China. On the other hand, the working conditions of graduates, particularly engineers, improve, along with their social status, which had previously been less highly regarded. Finally, better dialogue between the countries of origin and destination of job seekers, and the development of the private sector in the countries of origin, in particular through better social security cover for employees, ultimately convince many higher education graduates to return to their countries of origin to build a sustainable and flourishing economy.

Urban and regional planning

An urban-rural balance is sought after, thanks to the intelligent location of new transition projects. Urban and rural areas work together on projects on an *ad hoc* basis, particularly in the fields of agriculture, risks and pollution. Some rural areas manage to be well-developed and are attractive. However, most of the deep countryside is still marginalised in the majority of Mediterranean countries as there is no comprehensive land-use planning policy. The most remote regions and territories do not benefit from the technological advances made in cities, especially in the transport and mobility sector. The most remote territories remain excluded from communications infrastructure. Inequalities are therefore still present, particularly between the coast and the hinterland of countries.

In cities in the North, people become more involved in urban management and set up networks between urban centres known as “polycentres”, which are designed to be resilient and connected. The transition driven at the national and international levels to achieve carbon neutrality by 2050 is also felt at the local level, as local authorities think of ways to manage towns and cities in a sustainable and cooperative way, involving residents. The most developed local authorities collaborate with central governments in a co-decision-making system that combines a vertical and horizontal approach. In the South and East, a number of experiments attempt to reproduce this model of governance. Networks of Mediterranean cities on the three shores of the Mediterranean are organised to share experience and best practice.

In Northern urban areas, priority is given to non-polluting mobility, in particular through the development of electric and then hydrogen-powered vehicles. In Southern cities, governments invest in and support the development of public transport. Cities are designed to be resource-efficient thanks to the widespread use of the circular economy. Adaptation and mitigation solutions are largely based on technological progress and digitalisation (water management control using sensors, etc.).

Projects based on regional cooperation, such as [PRIMA](#) (Partnership for Research and Innovation in the Mediterranean Area), are better promoted and extended to urban planning and urban governance, in order to produce concrete impacts in terms of jobs in cities and outlying areas.

Mediterranean coasts are still highly urbanised, but efforts are under way to make urbanisation compatible with new energy or blue economy projects (wind turbines, sustainable aquaculture, “sustainable tourism”, etc.). Marine areas close to the coast are developed to take into account the future risks of sea level rise (including using dykes). Activities requiring “built” developments (construction, docks, etc.) are regulated, except those requiring immediate proximity to the sea. Coastal planning policies are more interventionist, but conditional on targets for saving resources and reducing CO₂ emissions. Human activities and land use are controlled thanks to more coherent and prescriptive regulations, aligning local constraints with the geography of activities and protection goals.

Economy and development policy

The EU, as the main driving force behind the new Euro-Mediterranean partnership, wants countries to cooperate to fight climate change and accelerate the transition to sustainable resources. It therefore encourages the use of new forms of low-carbon energy, gradually replacing fossil fuels. For example, the EU promotes clean hydrogen production in the South and East by expanding its “hydrogen strategy”, through regulatory and financial incentives, as well as the regional integration of electricity markets and grids. Wind and solar power are also developed on a large scale, thanks to financial support from the EU and foreign investment. Large centralised renewable energy production projects (solar farms, offshore wind farms, hydrogen) and nuclear projects are established along with a dense network of North-South interconnections. The industry and transport sectors, which are highly polluting, especially in Southern and Eastern Mediterranean countries, have been significantly decarbonised, thanks to European and international public and private funding.

However, this financial aid is backed by strong “green” conditions. On the Southern and Eastern shores, the energy transition is slow and gradual. It requires heavy investments at all levels, and comes up against strong resistance. Energy networks gradually become interconnected, but old energy use habits persist and are slow to change. In addition, the traditional polluting sectors continue to operate and slow down the real transition to a more sustainable energy sector coordinated at the Euro-Mediterranean level. All kinds of methods are used to shift towards more resource-efficient production and consumption models: education, taxonomies, funding, incentives, innovation, experimentation, etc. in a context marked by urgency and changing values. **Governments intervene to encourage changes in behaviour** through taxes, subsidies, and new standards, with priority given to economic tools. Taxes on goods and services that support the ecological transition and sustainable development are reduced, including a tax cut on agricultural land and natural capital. On the other hand, subsidies for fossil fuels or polluting activities are reduced or abolished.

However, these changes come up against inequalities in terms of economic, social and geographic situations. In order to reduce them, the decision is made to redistribute a proportion of the new financial income generated from the taxation of CO₂ emissions, resource use and the expansion of the trading market (ETS) to the Mediterranean. In particular, the aim is to finance the conversion of certain activities in Southern Mediterranean countries, especially those related to fossil

fuel production. In the North, some countries are proposing a new tax on capital tied to unsustainable activities. However, this system struggles to become widespread, with some countries instead setting up attractive tax systems for large capital.

New technology parks are developed in the Mediterranean, particularly in Southern countries, creating job opportunities for young graduates, who remain in their home countries to contribute to their economic dynamism. Major projects are on the table, the largest and most symbolic of which is to build a bridge between Spain and Morocco. However, territorial inequalities between urban and rural areas are still quite prevalent. Large-scale projects are concentrated in the major cities, and rural areas have less access to the job opportunities created by these projects.

Technology transfers are facilitated by the establishment of a common economic market that offers an avenue for positive development of the Mediterranean region. However, the social and technical contexts vary around the basin, and these transfers are different from one country to another. For example, in the South, they are accompanied by funding earmarked for education and the development of a competitive industry, which are *sine qua non* conditions for the technological transfer to take hold. The seriousness of this approach pays off, and several countries in the region catch up technologically and specialise, enabling their economies to take off and become part of the globalised economy. The EU's economic policy towards these neighbours is accompanied by an extension to Southern and Eastern countries, and the border tax set up in Europe to offset the CO₂ emitted in the production of imported goods. The European Union has invested heavily, and continues to do so, in data protection, including by introducing new protocols. However, data protection remains a cause of political tension, and it is not present in all areas. In the new digital economy, Europe is seeking to regain some independence from the American and Chinese tech giants. It supports European economic actors in the creation of new networks. In the South and East of the basin, previously isolated islands of digital excellence are supported by the EU, enabling them to be integrated into regional and global networks.

The fisheries sector is adapting well to the impacts of climate change. It manages to remain stable and not disrupt ecosystems. Measures are put in place to reduce incidental catches. However, there are protests, especially from small-scale fisheries. Quotas are imposed to reduce incidental catches, and surveillance is increased to ensure that the limits are not exceeded. To be profitable while complying with the strict quotas, large quantities need to be fished. The new policies are therefore favourable to large-scale fisheries, and small-scale fisheries suffer greatly. Tensions with other countries that come to fish in the Mediterranean are also felt, as they do not always comply with the imposed quotas. At the same time, the aquaculture sector is developing rapidly.

The Mediterranean is still a tourist destination in 2050. However, the sector has diversified significantly: the former "low season" is now also a period that attracts high tourist numbers. Tourism outside coastal areas and agritourism attract both local and foreign visitors. For historical sites that have been attracting thousands of tourists to the Mediterranean for years, technology serves a new form of tourism that promotes and protects these sites from overcrowding. Tourist numbers are managed by highly efficient regulation systems, and compliance with environmental standards is central and highly controlled. Some tourism also takes place virtually, with visits mixing authentic nature and virtual visits to the most sensitive sites.

Overall, this Euro-Mediterranean partnership benefits all the partners involved. As part of its drive to re-regionalise its value chains, in order to increase its autonomy and resilience, the EU encourages the return of certain types of production previously relocated to Asia. Trade increases from North to South and East and vice versa.

Science and Technology

The scientific and technological cooperation model is reworked across the Mediterranean to make it more sustainable and efficient, and benefit all countries in terms of innovations and jobs. The aim of the new system supported by the Euro-Mediterranean partnership is to strengthen the ties between research and business (through incentives for entrepreneurs to invest in research and development). Consortia are created between universities and public and private research

centres to promote effective knowledge sharing. These pooled research capabilities enable public-private partnerships to be developed and transform research projects into concrete innovations.

Technology is pervasive and the driving force behind sustainable development. For example, sea-related activities are changing, with the installation of offshore wind farms, and hydrogen-powered ships, etc. In the marine sector, this technology is expected to enable stricter law enforcement (in particular the Barcelona Convention protocols). A supranational surveillance fleet, Interpol MedSea, is in charge of enforcement and sanctions. It operates through a public-private partnership. The surveillance equipment is private and based on the latest technological innovations, while the surveillance units are common to the Mediterranean and not managed by individual states. Innovative tools produce real-time data on the state of the environment. At the COPs, the Mediterranean Alliance grants subsidies to member states on the basis of the results they have obtained in managing the good environmental status of the sea and the environment.

There are increasing numbers of technology transfers, especially from European countries to Southern and Eastern Mediterranean countries. These transfers involve the use of a number of open patents in strategic areas. Technological cooperation aims to create a Mediterranean innovation space focused on digital technologies, the blue economy and the energy transition. To support this, university and training policies are focused on technological skills and knowledge, especially when linked to digital technologies, platforms and networks. However, some governments are more determined than others, and successes are not being achieved on the same scale or at the same speed everywhere.

The widespread and accepted technological evolution enables relatively successful adaptation to degraded environmental conditions. For example, precision agriculture and remote sensing are developed to adapt to water shortages, especially in summer. New crops, which require less water, are also being planted. However, these changes in practice require investments and cause inequalities, as not all farmers can afford them.

The principles of the blue economy are spreading and governments and businesses are following the recommendations of the EU and major environmental NGOs. For example, maritime transport is highly decarbonised (in particular thanks to the increase of motorisation technologies with a lower carbon footprint such as hydrogen, biofuel and green ammonia), and the trajectories of cruise ships have changed (shutting down engines in port, ban on sulphur emissions). New forms of cruising (using sails) are on the rise. However, these transformations are limited to technological changes and require the massive use of strategic resources such as lithium. In order to preserve the good environmental status of the Mediterranean and to comply with strict environmental standards, Mediterranean countries procure them from outside the Mediterranean, which is a source of competition between states. New technologies also produce a lot of waste, which is difficult to manage in an efficient and circular way. Some technological waste is relocated outside the Mediterranean region, particularly to African or Asian countries, which creates controversy at the international level.

Society and internal governance

There are still many inequalities within Mediterranean countries, despite an overall decrease due to improved living standards. This strong path towards modernisation based on technology and digital technologies has left many people behind, especially in the South and East. For example, artisan trades are heavily impacted by the switch to all-digital technology. In addition, rural areas are marginalised because they are not well connected to cities and new communication networks.

Modernisation based on digitalisation and a strong technological component comes with trade-offs. For example, with scientific advances, there are recurrent debates on ethics, eugenics, transhumanism, the mainstreaming of AI, and the status of living organisms, without reaching any definitive conclusions or defining limits. Moreover, Mediterranean society in 2050 is unequally exposed to many risks. These risks are natural (earthquakes, floods and landslides), industrial or technological (oil spills, marine pollution, industrial accidents) and linked to climate change (heat waves, droughts or forest fires). In any case, they are increasingly interconnected, and technological modernisation makes industrial and technological risks the most likely to increase between 2040 and 2050. These risks are managed in a technocratic and private way, which does not guarantee the same exposure for all categories of the population. There are regional disparities in risk prevention policies. While the most developed regions have the necessary funding to build prevention infrastructure, others with fewer financial resources prefer to focus on risk awareness and public education.

Without systemic anticipation and prevention policies, inequalities in terms of exposure to risks will increase, more severely affecting fringes of the population that are already vulnerable, such as the poor, women and migrants, etc. After

disasters, areas with high economic value attract all the funding for infrastructure renovation (thanks to the tourist economy), while others are abandoned.

In society in general, intercultural dialogue is improving. Countries with more traditional values are evolving towards more individualism, and traditions are slowly becoming more liberal (less religious influence in the South as well as in the North, increased democratic aspirations and care for the environment). In 2050, Mediterranean civil society plays a balanced, and even major role in many bodies, although differences between the North and South, and countries persist. However, it is making its voice heard in the decision-making process, thanks to increasingly reliable and efficient network tools. In some countries (especially in the North and in some Southern Mediterranean countries), it has even become a permanent actor in everyday political life, not only during elections. This is facilitated by a better awareness of the environment, in the North as well as the South and East, which starts at school, and visibility in the media and governments, which have a duty of transparency when it comes to these issues.

However, civil society appears divided, between a civil society that is considered legitimate, which sits on official decision-making bodies such as the Mediterranean Alliance, and a more fragmented but no less significant civil society, which disagrees with the main driving force of new Mediterranean cooperation: technology and the green and blue transition, whose objective is economic growth. Therefore, despite remaining marginal, neo-Luddite social movements regularly speak out against technology and the social exclusion of the most vulnerable groups due to this model. The widespread use of AI in certain industrial and service applications destructures parts of the labour market. Many people are forced to accept more and more precarious jobs, which are increasing in number. This contributes to widening inequalities and fuelling social tensions.

However, in the Southern and Eastern Mediterranean, social appeasement is subject to strong resistance and moments of crisis. In some countries, it takes several years or even decades to overcome problems of corruption in some parts of the administration and to really involve civil society in governance. External mediation is sometimes welcomed to resolve these internal conflicts.

Education and employment

In many Mediterranean countries, governments increasingly see youth as an asset and a driving force in innovation and adaptation to climate change. Unemployment rates fall, thanks to improved education and training strategies.

Heavy investments are made by Mediterranean countries, especially in the South and East, to improve education systems, with the main objective of better aligning education with the labour market. In this respect, new initiatives are created, such as the “Inter-disciplinary Learning Centre for the Future of the Mediterranean”²⁰ to connect research laboratories and businesses offering jobs. An international undersea station is built for scientific research, and to democratise access to science on subjects related to the sea and the issues associated with it. It is also used regularly by schools for awareness-raising and observation programmes.

Young people are provided with assistance to enter the job market. Digital technologies are used to better target the needs of employers and job seekers, but also, in some areas, to monitor the efficiency of individuals at work (grading/rating systems, etc.). However, many young people from the South continue to migrate to the North to find employment, and find jobs in the healthcare and elderly care sector, which needs workers. More inclusive education and service policies are also implemented in Southern and Eastern Mediterranean countries in favour of women, to increase their employment rate. Governments undertake to implement mechanisms to monitor these policies. Awareness-raising campaigns are also organised, particularly to ensure that more women enter digital professions.

The informal sector, which is quite substantial in Southern and Eastern Mediterranean countries, will shrink in the 2030s. Incentives are put in place by the European Union, and adopted by countries to encourage these parts of the economy to

²⁰ ‘Blue Transition Policy Roadmap: Towards Transparent, Responsible, Inclusive and Sustainable (TRIS) Development in the Mediterranean’ (no date) EMEA. Available at: <https://euomed-economists.org/download/blue-transition-policy-roadmap-towards-transparent-responsible-inclusive-and-sustainable-tris-development-in-the-mediterranean/> (Accessed: 22 December 2022).

become formal, thanks to measures that facilitate access to insurance, reduced transaction costs (especially administrative costs), and assistance to make digital transactions more accessible. However, the dynamics of the transition in the South and East are still not enough to incorporate most businesses and job seekers into the formal sector, in a context of strong demographic growth.

Land and marine environment

Better cooperation and strict regulations in terms of environmental management are paying off. Ecosystems and biodiversity are regulated using market mechanisms or economic tools, and their value is assessed. The concepts of ecosystem services, pollution and carbon trading schemes, the ecological value of nature, and the valuation of carbon sinks are now regularly applied and used. Biodiversity benefits from the indirect effects of carbon neutrality policies (plant and forest plantations). Another previously endangered part of it is regenerating thanks to new processes based on scientific discoveries.

National conservation policies have been introduced with a focus on the protection of hotspots and the conservation of emblematic species. New funding is allocated to research in order to increase efforts to explore marine biodiversity, leading to the discovery of new species and the extension of protection to previously unknown species. DNA barcoding, aimed at identifying and cataloguing the genes of different species, receives funding to better assess the effects of climate, pollution and the ecological fragmentation of land on biodiversity. Using this technique, micro-organisms are used to remove pollution from sites, enabling endangered species to return. However, some experiments have negative rebound effects, causing people to mistrust science. Moreover, adaptation and mitigation policies have not prevented the structural transformation of biodiversity and ecosystems, which is considered by some Mediterranean populations as a failure on the part of public authorities who are too focused on technological advances. In some areas, such as deep-sea mining, the rhetoric remains ambiguous and no clear decision has yet been made.

The European Union has also invested significantly in Southern and Eastern Mediterranean countries to help them mitigate and adapt to the land and marine impacts of climate change, especially in the most vulnerable areas. Water resources in the Mediterranean Basin have decreased considerably since 2020, but regulation, stricter controls, and innovative technologies allow for better management. Leakage and waste have been greatly reduced. However, individual and collective behaviour is slow to change, along with the necessary structural reforms, for example in agriculture.

Some measures taken in the name of the energy transition and to secure water supply show their limits, and sometimes have detrimental effects. For example, this is true for the production of green hydrogen, which, after attracting a large amount of funding, experiences decline, mainly due to leakage problems that have a major impact on the expected yield. On the other hand, because of the industrial risks of leaks and explosions, some plants have construction delays due to protests by local residents. To secure water supply, desalination plants are developed more intensively, while stressing the need to improve treatment technologies (in particular by favouring membrane treatment over thermal treatment). However, these technological advances are slow in coming, and the environmental impact of these measures is much more nuanced than expected.

4. Assessment

This scenario involves a positive changing trend. It is an idealised but fairly realistic scenario, that is plausible. However, this kind of transition would require very heavy investments, and would be met with very strong opposition. It is not clear that the EU could lead such a partnership in the face of such strong internal and external opposition.

It should be noted that the Euro-Mediterranean partnership launched by the EU based on a “blue-green transition” deliberately leaves room for doubt as to the exact definition of the term “blue-green transition”. This term has the same ambiguity as the expression “blue economy”, which can be interpreted as the economy of all sectors related to the sea, or to “the sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of ocean ecosystems” (World Bank definition). The ambiguity is still present today, insofar as the Euro-Mediterranean partnership has implemented a transition towards decarbonised activities (especially at sea), but that relies heavily on digital technologies and digital innovations, which have had, and still have, negative impacts on the environment. It involves a hybrid strategy, which is environmentalist but also economic growth-oriented, in line with the European Green Deal, and the generally held view of sustainable development, implemented by most countries.

The effects of this scenario on the environment are mixed. On the one hand, stricter regulations in terms of environmental standards and economic regulation of the state of the environment reduce negative impacts on the environment and ecosystems. On the other, the “100% technology” approach and the development of major projects have negative rebound effects on the environment. Technologies do not save the environment, and they do not only have positive effects, such as offshore wind power, which damages marine biodiversity.

Moreover, this scenario does not see the elimination of already existing inequalities between Mediterranean countries and within countries, between the different strata of the population. The shift to World 4.0 also creates new inequalities, between populations inside and outside of markets. Inequalities increase between the entrepreneurial middle classes and other groups. A large part of the informal economy remains so, and does not reap the beneficial effects of the new blue-green model promoted by the European Union.

In the Southern and Eastern Mediterranean, some see the partnership led by the EU as a form of European neocolonialism, with the imposition of a market approach. The voices that oppose this transition feel that they are being subjected to a future for the Mediterranean that does not reflect them.

In this scenario, the only response to the climate and environmental crisis is the decarbonisation of the current economic model, including the decarbonisation of energy. Other avenues for adaptation, such as reduced consumption, a change in sector economic models, or land-use planning, are not explored.

Finally, this scenario requires heavy investments in environmental technologies (electric power, hydrogen, etc.), and, despite aid, Northern Mediterranean countries still have much more money to invest than Southern and Eastern countries. For example, this difference in resources prevents some less developed countries from successfully converting old sectors of their economies to the Economy 4.0. A duality therefore persists in this scenario, preventing the Euro-Mediterranean partnership from being perceived as a real and equal collaboration between the 22 contracting parties to the Barcelona Convention.

Scenario 5: Another sustainable development model specific to the Mediterranean

1. Abstract

Mediterranean countries and societies are very sensitive to the worsening state of the environment and climate, together with international pressures, and come to understand the dead-ends associated with a wait-and-see attitude towards the environment, and maldevelopment and potential marginalisation at the global level. They therefore commit together to a process of transition towards a new model for sustainable development, taking into account the strengths and weaknesses specific to the region. After an initial phase mobilising civil societies and territories to establish networks for sharing best practices, disruptive initiatives are implemented at the institutional level. In a context of “deglobalisation” that promotes endogenous regional development, an equitable partnership is created, based on strengthening South-South cooperation and renewed governance. This partnership has the dual objective of reducing regional inequalities and managing certain resources as common-pool resources, ranging from sea and heritage protection to research. At the national and local levels, the emphasis is placed on a number of aspects. Firstly, on reducing vulnerabilities and external dependencies. Secondly, on investment in new development and organisational models that meet both the Sustainable Development Goals (SDGs) and goals for strong sustainability that give priority to the climate, vital resources such as water, soil, coastlines, marine ecosystem conservation, as well as employment, initiative and poverty reduction. To support generational change, cultures, religions and civil societies engage in dialogue and participate, through varied contributions and cooperation, in developing new ethics and cultural pluralism as a fair transition. Based on a realistic expectation of the opportunities and risks associated with the context of the coming decades, the aim is to urgently and collectively develop a new pathway towards the sustainable development of the region. The Mediterranean invents a specific model that sets the example for the rest of the world.

2. Framing

Like Scenario 4, Scenario 5 is one of the potential pathways towards sustainable development of the Mediterranean. However in this case, the drivers of change are not so much Europe, integration into globalisation and technology, as they are a change in the international context which is more conducive to sustainable development, a more balanced North-South relationship, and strong participation from local authorities and civil society. Above all, it is characterised by the political will to move towards strong sustainable development through a major transformation of lifestyles, economic models and forms of governance, while respecting the cultural diversity and specific characteristics of the region.

Three key assumptions structure the scenario. First, the idea that sustainable development cannot be reduced to the implementation of specific environmental measures, but involves all aspects of development. Given the diversity of situations, this means that there cannot be a single “standard” model of sustainable development, but instead a variety of models, depending on specific geographical, physical, economic, human and other factors. Secondly, the conviction that a specific model for the sustainable development of Mediterranean countries is both necessary and possible in order to tackle the serious challenges and constraints specific to the region and take full advantage of its specific assets. There are many of them: sharing a common sea, its geographical centrality, attractiveness, quality of life and lifestyle, diversity and specificity of production, landscapes and soils, exceptional cultural and natural heritage, climate adaptation of habitats, its exemplary diet, solar and marine potential, youth and demographic growth (in the South-East), family solidarity and resilience, etc. Finally, the sense that a transition to this kind of model is possible under five conditions: strong international pressure in favour of sustainability, a more balanced North-South allowing for more egalitarian cooperation within a community of partners taking on shared yet separate responsibilities, extended responsibilities and the active involvement of territories and civil societies, a renewed regionalisation of economies associated with the desire to reduce dependencies, and finally a dual change in socio-political perceptions. On the one hand, this dual change must take place against the backdrop of a shared fear that the economic base of countries in the region will be directly threatened by climate change and unsustainable development, as it relies heavily on the rentier exploitation of natural resources. On the other hand, Mediterranean stakeholders must properly understand the many potential benefits associated with the transition: better living conditions, social stability, debt reduction and less economic insecurity, stronger democracy, conservation and enhancement of natural, landscape and cultural assets, and finally, safeguarding of the sea, which is an irreplaceable common heritage.

3. Dynamics and actors

Along with the pressures of the context, the willingness of actors is the determining factor in this scenario. However, unlike Scenario 4, the impetus does not come from a key player like Europe, but from the active involvement of everyone, at all levels. Civil societies and territories are organised into networks for experience sharing, acting as triggers, as sustainable development is taken into account primarily based on local realities and experiences. However, in addition to the decentralisation that this implies, this citizen or grassroots involvement is not enough. It is a matter of raising awareness and getting all actors involved, from the international level to local people and businesses, with:

- At the international level, an institutional system that recognises the major responsibility of Northern countries in the ecological and climate crisis, as well as the specific nature of the Mediterranean by giving it priority as an exceptionally vulnerable region. This system should also provide increased legal and financial resources (three-fold increase in funding for adaptation, the law of the sea and stronger surveillance resources for enforcement);
- At the Mediterranean level, the creation of sub-regional blocs in the South and East, balancing out the 27-country Europe, through an association of Arab countries, or Balkan states, around Turkey or between African countries. This is followed by the commitment of these sub-regions to new forms of cooperation with a view to joint yet separate co-responsibility. To formalise this partnership, two cooperation institutions are established, with a joint agency for cooperation in the event of disasters and a Mediterranean Bank for Cohesion and Sustainable Development (MBCSD), focused on climate change adaptation and development that preserves natural resources. This institution is financed by national and international contributions, in particular by the recognition of the ecological debt of developed countries.
- At the national level, a real effort is made to place sustainability at the heart of public policies, training and research. All these efforts are made to achieve a fair transition to a different development model. With this in mind, priority is given to reducing dependencies, protecting resources and land-use planning.
- At the local and civil society level, the transfer of certain powers to local authorities, rural communities, associations and populations. This would give the various local players a central role in the implementation of sustainable development and resilience strategies. These actors would become responsible for the management of certain resources, who administer them as common-pool resources. Finally, a network for exchanging local experiences has been set up between the different shores, so that they can learn from each other.
- At the economic and business level, proper planning for the constraints and opportunities associated with the context, innovation in businesses that makes the most of the Mediterranean's distinctive attributes and that also creates jobs that are sustainable, and diversification of business forms.

This will not all happen at once, and will take time. That is why this scenario should be seen as a process with several stages:

- The first step is to make people at all levels aware of the limits of globalisation in the face of the worsening ecological crisis. All over the world, political and economic players move towards a re-regionalisation of economic activities. There is a growing awareness that, in the face of socio-ecological challenges, an endogenous development model specific to the different regions will make for greater resilience and sustainability, in particular by limiting the transport of goods and enabling legal controls. European and Mediterranean companies are relocating their value chains around the basin. Foreign investment is now much more local, which benefits the Mediterranean.
- This first movement is immediately followed by a second stage to raise awareness and mobilise all existing institutional and other resources to build sustainable development in the Mediterranean. Dialogue between the

different shores plays a crucial role in this shared dynamic. The new interdependence of Mediterranean countries encourages closer political ties, which are essential to ensure the region's economic stability. Multilateral cooperation bodies are established to preserve this stability. They ensure equal dialogue between the various countries, which are then able to enforce laws more effectively, issue moratoria on unsustainable practices and protect natural resources (deep-sea mineral resources, investment in fossil fuels, etc.).

- Thirdly, dialogue develops between economic players and civil society on the different shores, thanks to the mobilisation of resources for exchanging best practice. We could envisage a “Rio” on the Mediterranean scale, where the Mediterranean Commission on Sustainable Development (MCSD) would play an important role, with networking for think tanks and the creation of knowledge sharing platforms. For example, farmers in the South would help farmers in the North to adapt their crops to new climate parameters.
- The final stage would be one of cultural and political transformation. Through generational change, the Internet and reduced social inequalities, this will first involve progressive convergence of the diversity of Mediterranean cultures towards a certain number of shared values or perceptions (e.g. justice and respect for the law, ecological responsibility, the role of women and youth, universal participation, Mediterranean solidarities). But it is also about giving concrete form to the institutional changes mentioned above, with the extension of international law, the creation of regional sub-blocs, a new North/South cooperative balance, decentralisation and the extension of democratic rules, and transition plans, etc.

This mobilisation is supported over time by social transformations and should gradually bring about an in-depth change in economic models, lifestyles, production and consumption patterns, as well as regional planning, towards another development model specific to the Mediterranean. This would be more sustainable, fairer, more ecological, more resilient and more autonomous, while remaining open to the world.

4. Scenario description

Context

The most important factor in the context is the worsening state of the environment and climate: the trend is for temperatures to rise by 2°C by 2050. This results in both increasingly frequent extreme events and major structural ecological changes, but also a strong response from the international community and governments, economic circles, funding bodies and public opinion. The perception of a potential tragedy linked to these changes convinces a majority of these actors that a major shift towards a strong vision of sustainable development is essential. There is a broad consensus on the need to implement the Paris Agreement, and then recognise the ecological debt of developed countries. This opens up new opportunities for markets, international investment and financing, but also new constraints. Standards and rules under international law become stricter, global taxes are created (e.g. on shipping and air transport), aid is made conditional, consumers impose new requirements, and a number of bans are enacted (e.g. global ban on the purchase of new vehicles with internal combustion engines in 2040). Almost all economic sectors and fields are concerned, especially those related to the sea and oceans.

At the same time, globalisation as it has functioned since the 1990s is called into question, along with the hegemony of certain states or economic giants, market deregulation, an increase in regional imbalances or dependencies and booming mobility. Faced with the increasingly tragic consequences of global change, all the world's political and economic players acknowledge the failure of the globalised capitalist model, and become aware of the advantages of a regional economic development model based on the relocation of value chains and sustainable production and consumption patterns.

Faced with globalisation, states are joining forces to form “regional” blocs to handle excessive debt and recurring crises, and preserve their specific social and cultural attributes. Value chains are changing to reflect a new trade-off between efficiency, proximity and crisis resilience, especially as the cost of long-distance transport rises. Harmonisation and solidarity mechanisms are developed within these “regions”, with priority given to intra-regional trade, reducing dependency (on food, energy, etc.), and protection from external markets (e.g. carbon taxes at borders). The world is organised around these multiple poles, which nevertheless aligns with a global governance of the commons.

The post-Ukraine war geopolitical context gradually improves, with less interventionism from major powers. Changes conducive to relative pacification of the Mediterranean region contribute to this momentum: successful reform of the United Nations system, better global security, settlement of one or more existing conflicts, regional withdrawal of China,

the United States and Russia, stronger Europe. Several factors favour the creation of new sub-regional alliances, especially in the South: pressures resulting from the economic and ecological situation (e.g. on oil producers), the easing of religious conflicts, rapid transformation of Arab and Middle Eastern countries, strong influence of Africa and absolute need to contribute to its development.

Fewer conflicts does not exclude increased tensions and uncertainties related to the scarcity or substitution of resources, whether for agricultural and food products, raw materials, land, water, plant products, marine resources or energy. The issue of resources and their prices and limits now occupies a central place in political agendas.

All this takes place in a global context marked by a global change in ways of living, working, producing and socialising, and by a change in value systems. These changes are especially associated with the general rise in levels of education and the development of digital technology: better access to knowledge and information, role of social media, more remote work and collaborative work, importance of applications and service platforms, artificial intelligence, but also an increase in individualism, intangible values and demand for greater democracy.

Geopolitics and governance of the Mediterranean

Thanks to these profound changes in the international context, and in the face of the threat of major ecological and social disruptions, there is a slowdown and then reversal in the increasing fragmentation of the Mediterranean region, gradually leading to greater sub-regional cooperation. Throughout the region, a strong and fair partnership emerges on all economic, political, cultural and ecological levels. A community of interests and culture is built around the Mediterranean, with ties to Europe, Africa and the Middle East, based on a common sustainable development project.

This cooperation is initially driven by local authorities and non-profits through the implementation of concrete sustainable development projects on the ground, including projects from the South to the North. Operating in active networks, these two types of players become essential driving forces in Mediterranean geopolitics.

Mediterranean cooperation takes a second decisive step forward by taking on an economic dimension. Against a backdrop of the re-regionalisation of value chains, companies in the North move a significant proportion of their production and investment to the South and East. Economic exchanges of all kinds increase between the three shores, in particular trade, which triples, while complying with ecological constraints. These include common minimum standards, “Mediterranean” labels, and codes of “good conduct”. This dynamic helps rebalance North-South exchange, while shifting the focus of all the countries in the region to the Mediterranean Basin. In a context where international flows are declining and value chains are relocating, the centres of interest of political and economic players in the Mediterranean shift from America and Asia to the Mediterranean.

As investment flows are all repatriated around the basin, the ecological interdependence that already exists between the countries bordering the basin is now bolstered by a strong economic interdependence. This makes it vital for all governments to ensure the political, economic and social stability of the region. This stability is vital to the region’s economic health, including for the European Union, which has supported and is investing massively in this move to regionalise production activities. To guarantee this stability, solidarity develops between countries. The main aim of this solidarity is to build shared capacity for crisis resilience and to ensure the sustainability of certain common assets that are essential to the region’s survival, such as the sea.

This solidarity is embodied through shared institutions. This was behind the Mediterranean Bank for Cohesion and Sustainable Development (MBCSD), which will play a key role in regional governance. Founded with capital provided by the 21 Member States and contributions from the sub-regions, including the European Union, it also includes specific resources from the payment of ecological debt by countries in the North, recognised in the 2030s. It invests in and supports the economic development of the basin. It also funds major training and research programmes, and regional planning strategies, in order to strengthen local resilience. It also raises substantial funding to protect natural resources and ensure their long-term management. At the same time, it provides a multilateral forum for discussion between member states, all meeting as equals. Finally, as a symbol of this new regional solidarity, the MBCSD sets up an Ecological Disaster Response Fund (EDRF), financed by the Mediterranean community. As soon as a region in the basin is affected

by natural disasters, which are becoming increasingly frequent, this fund is mobilised to finance emergency aid and provide care for the affected populations.

The new status of the Mediterranean in the political priorities of states around the basin is reflected in other initiatives, such as the coordination of statistical and observation systems, stronger enforcement systems for the Barcelona Convention, creation of a technical agency on major risks, roll-out of the position of “Minister for Mediterranean Affairs” in each state, shared diplomatic positions at the international level, etc. The European Union, which has been extended to all Balkan states, encourages this movement. This is reflected in the negotiated extension of certain structural policies, such as research, agricultural guarantee funds, trade policies, and the introduction of a carbon tax at borders, etc.

Stronger cooperation, based on dialogue, excludes any form of interference or domination relationships, which had previously marred relations between countries on different shores. One of the conditions for its sustainability is the establishment of a better balance between the Mediterranean sub-regions. This happens gradually from the 2030s, with the formation of political sub-groups in the South and East Mediterranean. These sub-groups take various forms: between the Maghreb-Mashreq countries, in an association of African or Arab countries, in the creation of a Turkish-speaking area or possibly in a Balkan alliance. These are just some of the many possible bridges between Europe and Africa or the Middle East that are changing the geopolitical landscape. In the region as a whole, this renewed focus on the Mediterranean also makes it essential to reduce cultural tensions linked to the past. A major remembrance and awareness-raising campaign on the cultural heritage shared by the three shores of the Mediterranean is therefore launched, along with symbolic events and opportunities for exchange, such as promoting intercultural media, the equivalent of Erasmus at a regional level, youth programmes for the environment and support for inter-Mediterranean non-profits, and increasing the popularity of the Mediterranean Olympic Games. There are so many opportunities to spread a culture of sustainable development, particularly about preserving the sea.

Demographics and regional planning

Thanks to a more rapid demographic transition than expected in the South due, in particular, to the education of women, the increase in the region’s population is moderate (580 million in 2050 compared to 520 million in 2020). Although the contrast between North and South/East remains very significant (-12% in the North, +18% in the East and +31% in the South), with an accentuated demographic decline in the North, which in some countries could even lead to collapse, the issue of ageing is now raised across all countries. This issue has important effects on health and intergenerational relations (cohabitation, retirement, conflicts of values, care, inheritance).

This moderation of population growth is one of the factors contributing to the decrease in migratory pressure. An increase in employment opportunities linked to the transition to sustainable development and the regionalisation of value chains reduces the need for young people in the Mediterranean to seek their future elsewhere. Finally, the rural exodus in the South/East slows down, further reducing migratory flows. Facilitated population mobility is becoming a two-way street, linked essentially to the demographic, economic and training needs of countries, with better settlement support for migrants. Co-development policies with countries outside the region, from which most migrants stem, limit these flows but are unable to significantly contain them.

Faced with increasing risks and ecological pressure, where populations live is becoming a key issue. In Southern countries, the continuing urban transition remains a strong trend. Urbanisation rates gradually approach those of Northern countries. Faced with the risks of highly concentrated populations in coastal areas and large cities, regional planning is now a fundamental public policy issue. Despite the precariousness of living conditions in large cities, the difficulties of access to housing, and the opportunities opened up by remote working, it is impossible to make metropolises less attractive without very active policies in favour of medium-sized towns and rural areas. There are strong constraints on coastal urbanisation and urban sprawl. Conversely, every effort is made to stabilise the population within countries and in rural areas. To achieve this, local powers are reinforced and aid is provided for agriculture and employment. Rural development and local development support programmes are launched. Rural towns become small cities well-equipped with basic services (health, education, agricultural services, etc.). New economies emerge, based on agriculture, tourism and crafts and their interrelationships with the environment. New towns, service centres, and infrastructure for transport and water access are built, energy is decentralised, the digital divide is reduced and local supply chains increase in number. In the North and South, opening up isolated areas requires mass investment in the construction or renovation of railways and digital facilities, which are *sine qua non* conditions for revitalising these areas. At the same time, the Mediterranean becomes a local space, with investment in passenger and freight transport by cabotage.

All this goes hand-in-hand with a paradigm shift in land-use planning. It is now a matter of working with nature rather than against it. In addition to policies to protect species and ecosystems, agricultural and planning policies place nature-based solutions at the heart of their strategies. This requires the implementation of ecological planning in all countries, taking into account environmental targets and climate risks alongside the more traditional objectives of spatial balance, quality of life and regional attractiveness. Local authorities and rural communities play a key role in the resulting transition.

In the countryside, a new political priority is given to the agro-ecological transition and disadvantaged rural areas, whether agricultural, pastoral or agro-silvo-pastoral. Traditional know-how is recognised and promoted, after being supplemented or realigned in the light of modern agronomic knowledge. Solutions are negotiated with the local stakeholders directly impacted and accompanied, if necessary, by payments for ecosystem services. They are implemented to restore ecosystems that have been severely degraded by overgrazing or the artificialisation of wetlands, in order to restore their functions and the production of ecosystem services. Supported by funding from the MBCSD, vast soil ecological restoration plans are launched to stop soil erosion. Farming practices change, and ploughing and other soil-aggressive practices are gradually abandoned, along with the mass use of pesticides and nitrogen fertilisers. Agroforestry, the restoration of degraded pastures or pastures converted to unsustainable farming, and soil conservation farming are promoted. These measures encourage the infiltration and storage of water and carbon, and can help support baseflow and preserve seriously overexploited water tables. These measures are shaping cultural landscapes into “combined works of nature and man”, which become an international symbol of the Mediterranean. This agricultural model spreads across the 21 Mediterranean countries, and is recognised in the 2040s by UNESCO as Intangible Heritage of Humanity.

In towns and cities, urban planning strategies are also drawn up, designed to be implemented gradually and to establish a new urban development model over time. Once again, the search for resilience is the main objective of this new model. To achieve this, everything possible is done to save increasingly scarce resources, particularly water and energy. The use of air conditioning systems in homes and the development of individual swimming pools are regulated. These needs are met by pooling the use of resources, and by giving pride of place to public spaces. New neighbourhoods are therefore built around squares, markets, gardens and public baths. Elements of traditional Mediterranean architecture and urban planning return to favour for architects and town planners. This includes compact cities that encourage shade and air circulation, the use of raw earth where possible, the widespread use of porticos around public spaces to provide shade and natural ventilation, patios in individual homes, and Mashrabiyas on windows, etc. Finally, urban agriculture develops to meet some of the food needs of local residents. In order to cool cities that have become suffocating in summer, the ground is made porous again, which encourages water infiltration, and green spaces, tree planting, and irrigated vegetable and fruit belts are developed to reduce heat islands and the consequences of heat waves.

In this context, Mediterranean islands become a testing ground for endogenous sustainable development strategies.

✕ Economy and development policy

In a context still marked by the COVID crisis, the inflation of raw materials and food prices and, above all, growing awareness of the urgent need to tackle climate change and the increasing scarcity of resources, all political and economic players see the need to initiate decisive substantial and operational change in the economic system. Globalisation is also beginning to show signs of running out of steam, and the international economy is gradually reorganised around major regional hubs that are both geographical and geopolitical.

Although employment and development remain top priorities, views about the economy and the frameworks in which it develops are undergoing profound change. In this world of greater sobriety, where the need to reconcile economic development with care for people and their environment has become a crucial concern, GDP no longer appears to be a relevant indicator. A new indicator gradually emerges at the international and national levels, integrating improved well-being, domestic work, natural capital and human capital alongside traditional measures. Thanks to ambitious sustainable development policies, the Mediterranean moves up the international rankings.

The ecological emergency and challenges to globalisation lead people everywhere to seek more sober, self-reliant and resilient production and consumption patterns, resulting in a new geography of production and value chains, and economic relocation. International finance, which has adopted new accounting rules integrating ecology, withdraws from

the financing of carbon energies and projects that are clearly unsustainable and destructive of nature. On the other hand, public and private green financing, especially for adaptation in the South, water and renewable energies has increased considerably, but with strict conditions attached. Some debt repayments or interest payments are abandoned or suspended, and the practice of central banks buying up non-sustainable assets becomes commonplace.

The Mediterranean region sees these changes in context as both challenges and opportunities for revitalising its economies, and tackling the associated risks of marginalisation. Driven by public opinion and eager to regain purchasing power and limit their carbon footprint, Northern countries encourage companies to relocate to the region, relying on a young, educated workforce. This mobility of companies is facilitated by digital technology and remote working. However, the option is not to focus entirely on competitiveness through labour costs, but to ensure that these investments contribute to development centred on product quality, while showcasing specifically Mediterranean assets, and sustainability. The jobs and activities created primarily for young people in the South and East help ease social tensions and achieve political stability in the region. This trend is reinforced by investments from the Gulf States, or by a possible alliance of Arab or African countries established after the 2030s.

At a country level, less developed countries continue to catch up economically, with growth significantly higher in the South and East (4 to 5%) than in the North (1 to 2%). However the focus is no longer on “growth at any cost”. Each country has its own growth trajectory, and all converge towards more sober, qualitative, autonomous and diversified development models. Mass investment is made in reducing dependency and waste (such as water), as well as diversifying economic structures in the “positive economy” (green and blue economy, food, health, clean energy, services, etc.), the circular economy (recycling, reuse) and the “functional economy” (replacing the sale of goods with the sale of services). Governments cease to subsidise fossil fuels and shift their investment to renewable energies, while bearing the cost of the transition, with the support of the MBCSD. There is mass support for the development of offshore solar and wind energy. It is a matter of implementing “win-win” strategies both for promoting the specific attributes of the Mediterranean area and transitioning to a sustainable and autonomous development model, in line with the SDGs and climate change challenges. In the same perspective, there are increasing joint projects and trade between regions, countries and businesses within a more legally secure framework, thanks to border protections, common standards and quality certifications. This dynamic is made possible by a modernised banking and financing network, and important North-South transfers (with diasporas playing a highly active role).

All these developments are supported by a major drive for innovation, including in digital technology. But this innovation is also social and in the appropriate or decentralised technologies. In Southern and Eastern Mediterranean countries, experiments are launched to reduce youth unemployment and informal employment, particularly by creating a universal basic income, which would either ensure a minimum level of social protection or promote entrepreneurship and training. Territories, but also more collaborative forms of entrepreneurship (cooperatives, social economy organisations, collective interest groups, business networks, etc.) play a key role in the implementation of these experiments and diversified endogenous development policies. This is particularly true of Southern countries, where the sharing economy continues, with the pooled use of some goods, an extension of cooperative forms of production or services, and an important role for neighbourhood communities. This development is supported at national level by a reform of access to credit, including credit tailored to the needs of agriculture and rural young people, and various forms of support to also encourage self-entrepreneurship and training. Some countries also experiment with a transition from social assistance for basic commodities (bread or soft wheat flour, gas, oil, etc.), which often benefit the richest first, to direct cash transfers with conditions attached.

To meet both ecological constraints and increasing consumer demand, the Mediterranean public authorities, supported by the MBCSD, back sustainable aquaculture and fisheries, which are essentially small-scale and local. By 2050, total fish catches will represent 1.5 million tonnes, compared with 4 million tonnes for aquaculture. A truly sustainable blue economy is developing, with maritime transport becoming less polluting and carbon-neutral, limited exploitation of the seabed and states not seizing ownership of the high seas.

In an international context where climate change is a source of numerous local tensions around the globe, the Mediterranean asserts its uniqueness, paradoxically becoming an exception. Supported by inter-Mediterranean programmes, especially via the Mediterranean Bank for Cohesion and Sustainable Development (MBCSD), the region’s cultural industry grows exponentially, driven in particular by the multicultural countries on the Eastern shore. The harmonious development of the region and the cultural revival that accompanies it fuel the production of many literary and cinematographic works. In a world that is losing its bearings, these works experience huge success on the international cultural market. While this vision of the Mediterranean as a haven of peace and prosperity is to some extent a fantasy, it ultimately has a performative power, and contributes to the cohesion of Mediterranean people, who feel proud to belong to the same community with a shared destiny. The growth of this cultural industry contributes to the region’s economic

growth, directly by creating jobs and contributing to the balance of trade, and indirectly by consolidating the Mediterranean's central position in international tourism.

The integration of sustainable development in all sectors

In addition to the guidelines already mentioned, all economic sectors essential to development contribute, starting with the specific situations in each country or region, to making transitions to move towards a reduction in dependencies, saving resources and fairer, moderate and sustainable growth models.

This results first and foremost in intentional policy to reduce all types of waste (food, energy, raw materials, packaging, etc.) based on a circular economy of recycling and recovery, with top priority given to waste and water management. In Northern countries, this is gradually accompanied by economic and tax incentives that force sobriety, even quotas, while taking into account inequalities. In all countries, dependence on carbon-based energies is reduced, even in gas and oil exporting countries, with the large-scale development of decentralised renewable energies, particularly solar energy.

With a view to ensuring the region's autonomy, the sustainability of water resources and quality of life, high priority is given to integrating agricultural, rural development, trade organisation, food and health policies. In addition to the measures already mentioned, this involves increased support for farms, secured land ownership, climate change adaptation for crops, and farming diversification (quality-oriented exports, subsistence farming, agro-ecology, agro-forestry). There is also a reorganisation of downstream activities (short supply chains, re-regionalisation of food industries, better value sharing with large-scale distribution, common labels, etc.), all based on the promotion of the Mediterranean diet and Mediterranean products.

In the field of urban planning, priority is generally given to improving living and housing conditions, both in urban and rural areas. This gradually integrates the longer-term objective of moving towards "post-carbon" cities that favour alternative modes of transport, climate-friendly housing, greening the living environment and property management. The historic Mediterranean model of the "sustainable city" is exported around the world, which is compact, inward-looking and adapted to climate change. On a regional scale, major investments are also made in public transport infrastructure, with the transition to a "local sea" allowing cabotage and intra-Mediterranean maritime trade on an unprecedented scale. The redirection of international funding towards these kinds of policies helps achieve this.

But it is especially in tourism and leisure that the move towards new, more sustainable models proves both necessary and difficult to achieve over time. The transitions underway incorporate all dimensions: diversified economies in regions that rely on one type of tourism, the development of rural or nature tourism, spreading out tourism over the year taking into account climate, regulating and re-scaling cruise tourism, regulated access to protected areas, taxation and reduction of externalities linked to unsustainable tourism. New, diversified economic models are gradually invented.

Science, technology, education, training

These transitions are not possible without a radical overhaul of education, training, research and innovation support systems at all levels.

At the national and regional level, a decisive milestone has been reached with the incorporation of sustainable development into school curricula starting in the 2020s, and the adaptation of training systems to the skills needed for the new economies established. Although the emphasis is on practical aspects, the humanities are not forgotten. At the same time, major research investments are made in "eco-technologies", "low-tech" solutions, or energy-saving technologies that partially replace ones with very high energy or water consumption, thanks to appropriate standards, incentives or regulations. Here again, local dynamics play a decisive role, with the goal of promoting the Mediterranean's assets in order to make territories more attractive and creative. A number of schemes are introduced, including support for new businesses, startups, FabLabs, small and medium-sized enterprises (SMEs) and artisans, clusters and hubs for positive innovation and sustainable and environmentally-friendly technologies.

At the Mediterranean level, a network is established for sharing best practices in both directions (North-South and South-North), along with systems for the management of patents and scientific publications as common-pool resources (open source). Research centres, observation systems, the media and civil society cooperate to develop environmental monitoring and awareness-raising. A networked Mediterranean University is established. Experts and students from all over the world come to the region to learn from Mediterranean agronomists, farmers, fishermen, architects, urban planners, businesses and researchers.

Land and marine environment

The fundamental assumption of the scenario is a temperature increase in the Mediterranean of 2°C in 2050, which is largely independent of the mitigation policies carried out in the region. This explains the major focus on adaptation, with an emphasis on the role of territories and spatial planning (location constraints for flood-prone areas, resilience strategies, local adaptation plans in several areas, including tourism, agriculture, and urban development). Absolute priority is given to preserving and improving water resources, in particular through changes to behaviour and to economic and agronomic models, through the promotion of “local projects” adapted to each context, and through the extension of common goods management methods. Soil improvement and the restoration of degraded land both make a contribution to mitigation targets. In cities, this adaptation is also combined with mitigation policies, with a view to the transition to “resilient” or “post-carbon” towns and cities. The risk culture is also widely disseminated with priority given to the most vulnerable populations and territories. At the same time, the prevention of major risks has been significantly improved, as well as mechanisms for intra-Mediterranean solidarity in the event of a crisis or disaster. Energy transition targets are obviously not abandoned, but efforts are essentially focused on solar power, decentralised renewable energy and, in Northern countries, more sobriety in energy consumption.

While risk management and adaptation to new environmental conditions form a large proportion of ecological policy action, Mediterranean governments also focus on everyday nature protection. Waste treatment and the fight against various forms of pollution are therefore stepped up all around the basin. In a world where sobriety has become unavoidable, Mediterranean public authorities hunt down all forms of waste and promote the recycling and reuse of used resources.

This emphasis on adaptation contributes to biodiversity protection policies, which now have stronger targets. Responsibility for the protection of hotspots is generally borne by the region as a whole. This is accompanied locally by a shift from protection policies to policies for the regeneration of environments and resources and, more generally, the integration of nature-based solutions and biomimicry into development. These policies are linked to health policies, in line with the “One Health” approach.

As for the sea, the goal of strict protection of one third of the Mediterranean marine area is achieved, with protected areas where intensive fishing and other economic activities are prohibited. Efforts to regenerate marine biodiversity take into account climate change and the arrival of new species in the Mediterranean ecosystem. Monitoring is stepped up for enforcement of the Barcelona Convention. Spatial planning of marine areas is integrated with coastal spatial planning through joint environmental planning approaches. A moratorium on the exploitation of deep-sea resources is introduced in line with developments in international law. Some expenditure, especially any linked to adaptation and the protection of biodiversity hotspots, is pooled at the Mediterranean level, thanks to the resources collected by the MBCSD.

Societies

Urban development, access to education, globalisation of digital information, and especially generational changes and the repeated impact of crises, change Mediterranean societies and their values, without affecting their diversity and specificity. Accelerated awareness makes them the driving force behind the transition to sustainable development. People in the Mediterranean become more politically engaged, particularly in social initiatives and the local management of some common goods such as water, health, and the restoration of natural areas and degraded agro-silvo-pastoral land, etc. Civil society becomes increasingly organised and involved in public policy, pushing for greater democracy. Awareness-raising efforts are bearing fruit, and people living in the basin are more aware of the benefits of more frugal lifestyles that

respect nature. Symbolic proof of this return to simpler consumption methods is the Mediterranean diet, which is once again adopted by everyone in the basin.

Relationships within families or between social groups are also changing rapidly. The role of women is better recognised, with equal rights and access to education. The employment rate for women in Southern and Eastern countries exceeds 30%. In addition to family solidarity, new forms of intergenerational ties and transmission develop throughout society. On the one hand, the growing challenges of ageing are better taken into account. On the other hand, the driving role played by young people in transitions is recognised. Mediterranean governments bank on their dynamic young people and give them priority access to employment and housing.

All these developments are not without numerous reactions and resistance, both in the North and in the South. However, the perceived urgency of these changes and their positive consequences gradually mitigate the strength of resistance. At a Mediterranean level, a shared Mediterranean identity is rebuilt thanks to reduced inequalities between the three shores, the existence of a common political project, the development of cultural exchanges and more accepted migration management. The sea once again plays a central role.

Governance

This scenario does not oppose civil society activism and public policy: the two complement each other. Under the pressure of the context and realities, all Mediterranean governments and territories gradually become aware of urgent socio-ecological issues and the need to change development models to avoid serious problems. This involves incorporating the environment and sustainable development goals into all policies, giving top priority to avoiding unsustainable situations (erosion, salinisation and ultimately loss of soils, expansion of deserts, collapse of marine or water resources, unliveable cities, poverty traps, etc.).

Initially, efforts are focused on implementing concrete projects at the territorial level. This requires active networks for sharing experience and a system for evaluating two-way solutions. However the major disruption in this scenario is the increase in more decentralised approaches and greater associative freedoms, giving territories and civil societies a major role in the implementation of sustainable development. Institutional innovations facilitate the management of certain resources or spaces, including maritime ones, as common-pool resources. Local adaptation and resilience plans based on a culture of risk are established, with national or regional incentives.

At the national level, the scenario is predicated on greater security of the law and the mobilisation of resources to better enforce it internally and ensure the implementation of international law, particularly the Barcelona Convention, at all levels. This law now clearly includes a certain number of general principles, such as transparency, responsibility, fairness, participation, precaution and meeting the SDGs. It includes the reforms needed to facilitate the integration of sustainable development, particularly in the area of land ownership and common-pool management of resources. The effectiveness of the law is strengthened, resulting in better law enforcement for everyone right across the basin, with no-one receiving special treatment.

With a view to both justice and effectiveness, public policies are gradually less siloed. The public authorities draw up strategies setting out precise priorities over the short, medium and long term, in consultation with the stakeholders affected. Tax reforms and redistribution mechanisms help reduce the inevitable social tensions associated with the various transitions. For example, fair tax mechanisms are implemented to help households and businesses change their energy consumption habits. Aid and compensation are granted to sectors affected by stricter environmental standards, such as the fishing industry, whose activities are more restricted. These fairness and social justice measures are an absolute prerequisite for the success of this transition to a sustainable development model.

At the international level, the principle of subsidiarity becomes central. While there is no integration in the Mediterranean based on the European model, nor any imposed normative development model, nation states in the region recognise their shared and differentiated responsibility for the management of common goods, in particular the sea and biodiversity. In the long term, an independent body will be established to provide management as a commons, by arbitrating conflicts and assessing and monitoring the commitments made by governments and companies.

All this is accompanied by diplomatic activism highlighting the exemplary nature of the Mediterranean. On the international stage, countries in the region become advocates of the urgent need for action on a global scale, with appropriate funding.

5. Assessment

The scenario places significant emphasis on political voluntarism and corporate activism, particularly at the territorial level. Despite its normative nature, it is not limited to a sustainable development toolbox and a reminder of what has already been said, for example, in the Plan Bleu foresight exercise conducted in 2005. Its uniqueness lies in its attempt to show what can make these shifts feasible in the changing international context or national societies, but also to assess the extent to which they can truly form the basis of an alternative and viable development model that meets the challenges facing Mediterranean countries.

The effects on the marine or land environment are positive, but not limited to them. The scenario also focuses on the quality of day-to-day life, particularly in the SEMCs. Nevertheless, it is important to remember that a significant proportion of the environmental changes will depend on what happens on a global scale. Environmental conditions continue to deteriorate, despite a change in model. This is why adaptation, resilience and diplomatic action on an international level are so vitally important.

Despite efforts to make the dynamics of the scenario plausible, it lacks credibility in many areas. It relies on a voluntarism and activism on the part of societies that are not the most likely in the current Mediterranean context, despite the awareness of ecological and social problems and pressure from younger generations. It takes little account of the conflicts of interest that remain very strong between or within countries, as well as shrinking room for manoeuvre, especially in budgets, and the obstacles in the way of transition in some sectors, such as energy. It takes little account of the major differences between situations in the North and South, and the possible contradiction between reduced dependencies, and increased resource requirements as a result of the relocation of activities. Finally, it is not completely convincing in terms of the viability of an alternative development model based on sustainable development. It lacks real economic drivers and sources of funding that quickly create jobs and wealth, especially since the scenario, in contrast with Scenario 4, does not rely totally on Europe, investment in mainstreaming industrial technologies, or a market-based approach to the green and blue economy. Although this is undoubtedly the preferred scenario, the conditions required for its implementation mean its positive effects may come too late. The issue of timing is therefore ultimately central.

Scenario 6: The Mediterranean Sea: global commons

1. Abstract

The starting point is degradation of the Mediterranean Sea so rapid as to provoke a strong global reaction from societies, countries and international organisations. This powerful reaction begins in the 2030s, and leads to the conviction that the Mediterranean Sea can only be saved if it is treated as a global commons. This vision is part of a more general “One planet, one ocean, one humanity” approach, and sits within a dual context of mobilisation for the oceans and recognition of the rights of nature. The objective of exemplary restoration of the Mediterranean Sea becomes a priority for the international community, which decides to finance an ambitious programme to restore the quality of the sea, as a matter of urgency, in order to deal with the risk of irreversible degradation of this area, which is a global biodiversity hotspot visited by over 400 million tourists a year. This mobilisation supplements efforts already underway through the MAP and the Barcelona Convention. As a microcosm of the challenges facing the entire planet, the Mediterranean, united around its sea, becomes a kind of test site for learning about the collective management of a global commons. The sea therefore becomes a vast laboratory for multi-scale observation and action, and gradually becomes a powerful tool for cooperation between societies, Mediterranean countries and the rest of the world. It opens the door for this dynamic to percolate through the water cycle, downstream to upstream. The good environmental status of the sea, which includes preservation of biodiversity, long-term management of productivity and cutting pollutants, requires sustainability to start from the sea and work its way up the rivers. To have a healthy sea, you need well-developed coastlines and clean rivers. As a logical consequence, human activities that have an impact on the sea are better regulated and controlled, starting with coastal areas followed by the gradual extension to all catchment areas. The water cycle becomes a vector of good global governance, with the sea as the beneficiary and fruit of the efforts of Mediterranean countries. The Mediterranean Sea, a global commons, becomes the symbol of Mediterranean renewal, built collectively, together with nature.

2. Dynamics and actors

Initial conditions for the scenario

The first prerequisite for this scenario is strong global awareness of the importance of the seas and oceans in the functioning of the major ecological cycles, accompanied by changes to the law of the sea in order to extend protection. This falls within a more general context where nature is increasingly recognised as having rights. Driven by influential scientists and spokespeople, the challenge of protecting the oceans becomes a major issue in the media and on the international agenda, with the Mediterranean at the top of the agenda.

This development is justified by the very rapid degradation of this sea, its biodiversity and its services. Scientists increasingly document systems drawing closer to tipping points, which triggers a reaction from the international community and many Mediterranean countries. People realise that they will all lose out, on all levels (especially tourism) if they do not act quickly and work together. A fairly rapid reaction is required, because a simple transitional approach would not provide enough impetus and justification for major efforts over at least three decades.

The involvement of the international community is also a testament to the fact that the economic and geopolitical situation of Mediterranean countries means that they cannot tackle the challenges they face alone, and that they need support to reconcile protection of the sea with other political emergencies. The Mediterranean’s difficulties in solving these problems on its own are therefore another condition for this scenario.

Actors and associated stakeholders

Scientists naturally play a key role in sounding the alarm. But, in order for there to be an effective reaction to the observed trends, all actors need to gradually feel involved, on a global scale, and work together in a concerted manner, including international organisations, economic leaders, governments, influencers of all kinds, including artists, multiple civil society networks, and religious authorities. As the levels of awareness and radical decisions will be varied at first, and as considerable funding needs to be implemented over the first decade, the process can only be taken on through

collaboration with the United Nations, working with nation states and a body that represents all stakeholders involved in safeguarding the global public commons. The occurrence of this scenario depends on the possibility of inventing an original form of governance linking these two levels.

Different phases

Although the 2020s saw a succession of conferences and scientific initiatives that gradually put the seas and oceans at the top of the international agenda, closely linked to climate issues, it was not until the end of the decade that the tragic situation of the Mediterranean received specific attention from a wider audience.

The first phase begins with a period of accelerating decline in the quality of the sea, leading to serious disruption in several economic sectors that depend on it. Some ecosystems collapse as a result of a combination of over-fishing, changes in the coastal marine environment, pollution, and excess tourist numbers. Massive eutrophication of coastal waters at many sites leads to toxic algal blooms and jellyfish at the height of the tourist season (in the Adriatic Sea, Aegean Sea, and the Gulfs of Gabes, Naples, Izmir, etc.). This situation is compounded by major bottlenecks in regional cooperation. These repeated crises lead to high levels of tension, and even local conflicts, between the countries involved, with each country blaming the other for the damage caused.

The second stage involves mobilising the entire international community in the face of these upheavals. The disruption that will “generate” an in-depth transition is growing awareness of the potentially catastrophic nature of these changes, which is amplified by social media and the publication of increasingly alarming scientific reports. This disruption is particularly dramatic because the Mediterranean has been excessively idealised for publicity for tourism purposes, and remains little known. It is now considered unacceptable for the Mediterranean to become a sea devoid of fish and birds, and full of oil residues and microplastics. Added to this is the growing awareness of its irreplaceable ecological role and its potential for radical transformation by 2050. The disruption is therefore cognitive, cultural and linked to everyday experience, with the fear of seeing a world and regional heritage that had seemed to have been taken for granted disappear in the near future.

On the basis of these objective and subjective observations, momentum for active reaction is set in motion at both the global and regional levels. But this is inconceivable without four initial conditions:

- First, worldwide mobilisation organised under the joint impetus of scientific communities and non-profits;
- Second, favourable legal changes to the law of the sea and environmental law, and the introduction of new legal instruments, such as the recognition of the rights of nature and those of future generations. The idea of recognising the Mediterranean as a legal entity in its own right was touted as early as the 2020s and accepted by the mid-2030s;
- Third, the creation of an original governance structure combining the mobilisation of civil societies at an international level, the regional cooperation structures set up by the United Nations, and the nation states or local societies. There is no obvious structure for managing a global commons. However, as for infectious diseases, it is possible to imagine a structure involving the United Nations (MAP and the Barcelona Convention with other UN agencies), in close cooperation with nation states and other international organisations (IUCN, etc.), and a Foundation that offers significant space for national and local representatives;
- Finally, the last condition, at the heart of all the others, is mass investment in scientific knowledge and dissemination, for a sea that is still poorly understood.

The third phase of the scenario is the implementation of a policy for managing the sea as a commons, linking the different levels of governance involved, from global to local. It is conceivable that this will involve a long and ambitious transition towards multiple improvements in all Mediterranean countries and for all sea-related activities. This will require trial and error, turbulence and opposition, as well as a public effort to cushion or offset the effects of initiatives taken at all levels. Three major advances should support a gradual new balance in governance:

- First, stabilisation of the two-headed structure proposed in the previous phase, which involves negotiating institutional arrangements, structuring a binding agenda and mobilising substantial funding over at least the first decade. Due to the large number of actors involved at all levels, the scale of the financial flows required, and the innovations to be put in place to organise multi-scale management of a regional sea as a commons (with potential for extrapolation to other threatened regional seas), it will undoubtedly take time for the governance structure to be put in place and to find its full legitimacy;

- Second, support from strong scientific momentum in the Mediterranean Basin. It is likely that substantial and growing investment in scientific observation, measurement and modelling systems will rapidly strengthen justification for the measures taken and, above all, for the continued extension of sustainability policies. In this scenario more than in the others, substantial resources will be allocated to knowledge in general, and to education, research and observation technologies, in particular through participatory observation, the creation of a Euro-Mediterranean fleet of mid-short and coastal oceanographic vessels, or the creation of the equivalent of IPBES for the study of Mediterranean biodiversity. As restoration moves up rivers and then catchment areas increasingly further upstream, ground (fixed sensor stations), air (drones), and space (satellites) resources will be implemented and integrated into databases made available to the research community. Modelling will be mainstreamed to demonstrate the long-term economic value of restoring the services provided by nature, not only the sea but also wetlands, rivers, agro-ecosystems, soil and, by extension, all upstream ecosystems. All these results will be disseminated in order to boost support from all actors and encourage their engagement, including in everyday actions;
- Finally, neither global mobilisation, new funding, nor major scientific investment in the Mediterranean Sea will be enough to make the prospect of managing this sea as a commons a reality unless this management is locally appropriate and integrated into regional or local policies. The key factor in the success of this third phase is the launch of programmes that take into account specific sub-regional features, such as in the Aegean or Adriatic Seas, or even on an even finer scale of sub-basins, estuaries or coastal cities. This includes extensive education, training and information programmes to mobilise institutions in all countries and territories involved, along with the general public and visiting tourists. Significant financial assistance is also provided to offset any investments made or constraints imposed, such as the abandonment of industrial, tourism or infrastructure projects, etc.

Finally, there is a fourth phase of geographical extension, during which the dynamics that began at sea spread upstream. The initial positive results obtained for the sea lead to a desire to extend sustainability policies to all catchment areas. All economic sectors present in these catchment areas gradually get involved, in particular, agriculture, industry, urbanisation and infrastructure, with the introduction of a certain form of common-pool management of these rivers, based on the model of river basin agencies. It is a matter of reversing how people conceive the place of humans in relation to a commons as vital as water. Consumers help support the natural water cycle, rather than “helping themselves” to water without worrying about the consequences. If all this momentum succeeds in achieving its objectives, it should be possible to extrapolate this model of sustainable development to other regional seas, with the necessary adaptations.

3. Scenario description

External context

The climate is changing at an alarming pace, with an average projected increase in the earth’s temperature of about 2.5°C, and about 3.5°C in the Mediterranean by 2050. International organisations and scientific institutions continue to strengthen the credibility and accuracy of these projections. The dynamics at work mean that extreme weather events become increasingly frequent, with deadly heat waves, mega-fires, storms and even hurricanes. On land, the most worrying development is the deterioration in the water balance (rainfall-evapotranspiration) and a consequential aggravation of hydrological and agricultural drought problems. Sea warming and acidification are faster than expected. Biodiversity changes with an accelerated arrival of species from the South, especially in marine ecosystems: fish, crustaceans, molluscs, plankton and algae are often of subtropical origin (especially from the Red Sea and North-East coast of Africa). Summer living conditions are stifling in the Mediterranean, especially in big cities in the South and East. The wealthiest residents migrate North for the hottest half of the year.

The global context remains tense but without any major open conflict. The major powers have gradually divided the world into zones of influence, avoiding armed confrontations. Territorial issues gradually become less influential compared to the soft powers of advanced technologies and associated standards, and cultural and linguistic influence, etc. Inequalities between the North and South and within countries are maintained or exacerbated. This is reflected in an increase in migration which often starts outside the Mediterranean (Sub-Saharan and Central Africa). This migration destabilises the Southern Mediterranean, and then Northern Mediterranean countries. This phenomenon of increased migration, is exacerbated by climate change, and can be observed on every continent. It is a source of diplomatic and sometimes even military tension between countries that struggle to agree on joint policies through a co-development approach. This is also true in the Mediterranean region, where the dynamics of cooperation have been weakened.

This leads to poorly-prepared measures intended to avoid open conflicts and humanitarian tragedies. Then, in the face of these pressures, and a succession of tragedies at all stages of migration (famines and violence in the South, migrants drowning as they travel by sea, etc.), Northern countries implement ambitious policies to reduce migration at source. These aid plans shift gradually from emergency humanitarian operations to structural policies for investment in vital areas (water, agriculture, education, training, housing, etc.).

One environmental crisis follows another around the basin. Degradation of the Mediterranean is increasingly alarming, to the point where it is in danger of becoming a dead sea. Faced with the risk of ecological collapse of the sea and the entire Mediterranean ecosystem, international public opinion stirs, and under pressure from the public and some scientific figures, a coalition of international NGOs, states and territories intervenes. Although Mediterranean states had long begun to cooperate to save this priceless common heritage, it was missing an actor from outside the region capable of extending these initiatives, representing the responsibility of the entire world community. With the consent of Mediterranean States, the international community declares the Mediterranean to be a “global commons”. Substantial funding from both public and private sources, and from charges for the use of marine heritage, is available to governments and local Mediterranean actors to help them make the transition and do everything possible to restore the good ecological status of the sea and land (catchment areas). At the same time, the Mediterranean becomes a testing ground for original legal arrangements for managing common property.

Demographics and regional planning

Mediterranean demographics follow a low growth trend with the population increasing from 520 million (2020) to 582 million in 2050. However, a distinction must be drawn between the three sides of the Mediterranean. In the North, the population falls from 196 to 172 million, with twice as many seniors as young people (17%), and in some countries, there is demographic collapse. In the East, the population increases by 20% to 146 million, with seniors accounting for 20% of the population, and young people accounting for 26%. In the South, growth is stronger at 30%, for a total of 146 million.

The dominant trend is for a growing concentration of populations and activities on the coast. The aridification of the hinterland and the continuing degradation of agro-ecosystems in the South and East accelerates the rural exodus towards cities. Urbanisation and the concentration of populations in cities, especially along the coast, initially lead to a general deterioration of living conditions outside of gated communities. Local crises arise on the most fragile coastlines, and the most densely populated and therefore most artificial. In some areas, tensions linked to the over-concentration of tourism foster these crises.

However, from 2030, two factors help reverse this trend. The prospect of rising global sea levels, although relatively limited at the time, begins to have an impact and gradually encourages human activities to move inland. There is talk that cities around the Nile Delta, such as Alexandria, could be directly threatened as early as 2050. Above all, there is much more widespread awareness of the limits, risks and costs associated with population over-concentration, whether permanent or seasonal. Concerns about land-use planning (including on the coastline), time planning (particularly for tourism) and land ownership have moved from marginal or relatively ineffective to central. Despite many difficulties, the need for some form of ecological and land-use planning in coastal areas, including the immediate sea, gradually becomes apparent, including in Southern cities. Measures to protect the most fragile ecological areas are extended. At the same time, civil society becomes increasingly involved in the common-pool management of some urban areas, housing estates, green spaces, heritage sites, dunes, beaches and urban wetlands, dikes or fire-fighting systems. Coastal zones therefore become an ideal testing ground for common-pool management by local residents or local authorities. Outside urban areas, the target of preserving at least a third of the coastline as protected areas, extended to coastal marine areas, becomes the rule.

Economy

After a period of global economic stagnation and juxtaposition of national policies with no minimum consultation or long-term vision, Mediterranean societies organise themselves from 2030 to integrate into their development policies the objective of protecting the sea, which has been collectively agreed upon. In some areas, this implies major transitions. However, only part of the economic fabric is affected. In many sectors and regions, economies follow in the footsteps of the 2020s, with significant differences between countries. Managing the sea as a commons will naturally bring new constraints and opportunities, but will not necessarily change all economic dynamics.

Apart from activities directly or indirectly linked to the sea and catchment areas, the main trend is towards more moderate growth than in the two decades between 2000 and 2020, although the environment and climate are taken into account to some extent in the expectations of private players in both the North and South. The need to decarbonise the economy is established as global target from the 2030s onwards, forcing the economic world to make changes in every economic sector and reduce dependence on fossil fuels. In the South, faced with the realisation that oil, gas and tourism income are threatened in the medium and short term, governments decide to diversify their economies to reduce their vulnerability. Southern Mediterranean states gradually engage in economic cooperation in order to build dynamic and strong economic sectors capable of integrating into the global market. Competitive companies are springing up in the South, particularly in the chemicals sector, which benefits from local fossil resources that continue to be used for this type of application. This increasingly important economic cooperation, requiring ongoing sustained dialogue, leads to a détente in relations between states previously trapped in long-standing latent conflicts. These conflicts are sometimes settled diplomatically, which reassures international investors and enables major infrastructure projects to be launched. A continuous railway line eventually connects Rabat to Riyadh, which boosts economic cooperation and South-South trade. After repeated scandals linked to corruption and tax exile by the economic elites, and strong social protest against the ever-increasing inequalities, the early 2030s see the increasing taxation of the super-rich. This development is not without crisis, especially in Europe, but a fairer tax system gradually becomes more widespread. The ever-increasing economic and political cooperation between the various states in the region helps foster cooperation in the fight against tax evasion, despite the reluctance of some states that previously benefited from it. This revenue not only helps reduce the risk of social unrest but also funds vital infrastructure and decarbonisation. Finance partly transitions away from greenwashing towards more sustainable investments, for communication reasons, but this conversion to the green economy remains partial. It also changes because of pressure from insurance companies which have calculated that the neoliberal model of the 2000s was leading to increasingly costly disasters. Finance is therefore becoming partially “greener”, more out of self-interest than out of virtue, and gains a form of social recognition.

Despite controversies, increasingly strict standards, often inspired by the EU with the goal of maintaining its competitiveness, also start to be applied globally with NGOs specialised in control. Various monitoring and surveillance tools, in the digital world as well as in the field, facilitate this kind of service. However, these changes do not occur at the same speed across all sectors. While the energy sector continues to lag behind in decarbonisation due to the large volume of stranded oil and gas assets, other sectors (chemicals, construction, road and rail transport, etc.) are making progress in terms of reducing their carbon footprint, making materials recyclable, and machines repairable.

In the South and East, new agricultural and rural strategies are implemented to boost investment and encourage entrepreneurship in the agricultural fabric and rural areas. Despite these efforts, there is a trend of increasing food insecurity in many Mediterranean countries, particularly in the Maghreb and Mashreq, due to a lack of sufficient water and/or land resources. However, regional food security remains partly assured by the development of trade with water-rich countries.

A radical transition in activities linked to the sea and its catchment areas

In the 2020s and 2030s, activities linked to the sea and its catchment areas are already part of this general trend towards progressively greener economies. But they will have to make a more radical transition with the Mediterranean being listed as a global commons. This transition is based on the water cycle, in two stages:

- In the first stage, all technologies applicable to the blue economy and water cycle management are mobilised to reduce pressures on Mediterranean ecosystems. Like bluefish tuna in the 2000s, many fish stocks are saved from overfishing through surveillance, measuring and control systems that use fleets of drones managed by AI. While fishing remains below 1 million tonnes, aquaculture continues to grow in more environmentally-friendly forms, reaching 4 million tonnes. Monitoring, measurement and control systems are also used to restore sustainable management of renewable groundwater resources.
- At the same time, and wherever possible under the right conditions, water resources are protected, purified and recycled, and agricultural and industrial production systems are modified to help farming adapt to the new climate and reduce flows of pollution into the sea. Protecting the sea means not only cleaning up rivers and coastal effluents, but also making better use of available water and irrigating the land.

The shipping sector changes with the mainstreaming of decarbonised motorisation technologies such as renewable electric power, hydrogen, sailing, Magnus effect rotor sails, etc. These innovations are used to promote “green” cruise tourism, even though overcrowding at some sites remains problematic. In order to maintain its position as the world’s leading tourist destination, the most popular sites set up a sustainability charter and offer virtual tours in HD Metavision to alleviate tourist numbers (Venice: 28 million visitors in 2022; entrance fee and quotas from 2030).

In the off-season, when the weather is cooler, national and international tourist flows are encouraged by developing new holiday types: eco-agritourism, sharing local life and activities (crafts, fishing, seasonal harvests, etc.). This alleviates pressure on coasts and islands, spreads tourist flows over the whole year, and finally, promotes cultural and relational exchanges beyond commercial services. The development of this “green” tourism also boosts rural areas and helps reduce the gap between these areas and towns and cities and coastal areas, which are now better integrated into globalisation.

From the end of the 2030s, the objective of strict preservation of the sea and restoration of its biological capacity will have a much more structural impact on all the activities that directly impact it. This is not just the blue economy, which now has a strong sustainability component, but all activities linked to water quality management, waste treatment and recycling, plastics substitution, pollution treatment, and ecosystem regeneration, etc. Standards are made significantly stronger, not only in coastal regions and catchment areas, but also for all activities with a significant impact on the sea, including the exploitation of hydrocarbons and deep-sea resources, industrial fisheries, non-environmentally-friendly maritime transport, large cruise ships, but also aquaculture, desalination plants and certain forms of tourism, etc. Activities allowed in Marine Protected Areas are strictly limited. As a result, the Mediterranean gradually becomes a key economic hub in all these areas of ecological excellence under transition, as they benefit from funding raised by the Foundation for the Safeguarding of the Mediterranean. At the same time, islands and some coastal regions become laboratories for a circular and symbiotic economy that serves as a global example. The social co-benefits gradually appear, including in Southern countries.

Science and Technology

Science and technology are developed in a systematic way across the Mediterranean, with a mixture of a kind of “Marshall Plan” and “Erasmus programme” for science, technology, innovation and training. Aware that only strong cooperation can enable the region’s R&D to find solutions to save the sea, the three shores of the Mediterranean launch scientific cooperation programmes in ecological marine sciences. This cooperation in science falls under the creation of a regional equivalent of IPBES, focusing on knowledge of Mediterranean marine ecosystems. At a more technical level, this cooperation focuses on the most sensitive areas of ecological restoration of the sea and catchment areas, such as:

- Degradable bioplastics to eventually replace all plastics;
- Some marine technologies: multi-purpose renewable energies that can be integrated into the marine environment, low-carbon vessels for both fishing and maritime transport, electric or hydrogen-powered engines, etc;
- Sea surveillance and information systems: fleets of drones, deep-sea exploration and mapping, autonomous or fixed sensors for automatic species recognition, algorithms for developing new dashboards of indicators on the quality of marine environments, widespread tagging and monitoring of large cetaceans, AI applications, etc.;
- Techniques for improving water quality and management throughout the water cycle: leak detectors, filtration systems, ecological and energy-efficient desalination systems, intelligent network systems, wastewater recycling, sensors, grey water management, etc.

These R&D capacities require a high level of regional cooperation, which justifies the funding of research centres focusing on key issues, such as digital technologies, blue technologies, the energy transition, the circular economy, water-efficient agricultural production methods and closed-circuit industrial processes. With a view to managing coastal, maritime and river areas as a commons, the development of citizen science is widely encouraged, including in Southern countries. It involves local residents and associations in the observation and even management of certain environments. This local dynamic does face some issues in terms of standards, languages and data processing, but the benefits far outweigh any dysfunctions. The involvement of societies, alongside the widespread prevalence of “digital natives”, curbs the attempt of GAFAM+ to gain supremacy in data access and processing. The governance put in place to ensure progress in marine conservation guarantees the transparency, integration, synthesis and quality of all the information produced.

Society and governance

Societies

At first, in all the countries around the Mediterranean Sea, societies are disoriented as the increase in threats to their ways of life and economic status generates anxiety: acceleration of climate change, loss of resources and heritage, destruction of social groups despite the Internet, difficulty in discerning reliable information, job insecurity, exacerbated international competition, crises in public services in many countries, including in the EU, degradation of ecosystems, increasing pollution, growing economic and financial vulnerability of Southern countries, which are still overly dependent on rentier economies (phosphates, oil, gas, etc.).

However, during the 2030s, aggravated climate and ecological tensions, particularly with regard to water and the sea, and more training, education and awareness-raising campaigns on these issues at all levels, make societies more aware of the scale of current threats. They respond by developing community values around care and the collective management of common goods. This change is the result of maturity and ownership of both global and local environmental issues, in particular issues linked to the sea, by the majority of Mediterranean societies, although they are struggling to express themselves in the political sphere. As part of a global movement to save the Mediterranean, local civil societies become aware of the urgent need to act on vital common issues without relying on traditional political mechanisms. This call to action is obviously not uniform across the Mediterranean, and the timeframe varies. It begins in the Southern Mediterranean, where global change and the activity of large multinationals threaten common resources, in particular coastlines of interest for the tourism sector, and water. Reviving a long tradition of common-pool management of resources, particularly water, a vast socio-cultural movement re-emerges to promote the preservation and sustainable management of the commons by local communities, who are the first affected by these crises. Responsibility for common resources is extended to the sea, the circular economy, the protection of coastal areas and Marine Protected Areas. This movement develops quite quickly in the East of the basin, as well as in the Balkans. In the North, where individualistic values are more deeply rooted, societies are more fragmented and crises are less severe, these new forms of organisation take longer to become established. There is therefore a shift away from political values (represented by parties) and religious values (represented by clerics) in favour of local, cultural, linguistic and ecological solidarity. This takes various forms, depending on the region and the different cultural contexts of the basin. There is an increase in local assemblies, community councils, neighbourhood authorities, community gardens, associations and NGOs working with local authorities. Young people play a major role in this because they have understood that they have to get involved directly for action to be effective. Increased representation of women at all levels of decision-making helps facilitate dialogue and increase pressure on decision-makers. Ultimately, the success or failure of this transition towards management of Mediterranean marine heritage as a commons depends on the involvement of everyone, including the economic actors most affected, such as fishermen, shipping companies, developers and farmers.

Governance

To protect the Mediterranean, funding is secured through low taxes, but on broad bases, essentially based on uses of the sea, and international tourist flows (more than 400 million visitors per year - excluding pandemics), via air transport, site visits, and maritime transport, etc. To this is added a share of pollution-related charges levied on catchment areas (and any fines imposed), which is collected by basin agencies or equivalent bodies. These considerable flows are managed by a hybrid organisation similar to a “Global Fund”, working in close collaboration with the MAP and the countries participating in the Barcelona Convention, with tax agreements between Mediterranean states. These resources will strengthen existing and active regional organisations in the long term, including the Mediterranean Action Plan, its Protocols and activity centres, along with networks of universities and professionals specialising in marine sciences in the Mediterranean. They will also enable new actions, such as financing irrefutable baseline assessments of the state of the environment, setting up an equivalent of IPBES for the Mediterranean ecosystem, monitoring networks, and, above all, support for the necessary structural actions and transition programmes, with sustained and well-equipped monitoring resources. These monitoring and control systems are financed on a global basis, but are mainly managed by regional bodies. What’s new is that their results are partially validated by an international scientific body and are widely open, in complete transparency, for consultation by companies, associations, nation states and the general public, with full enforcement in the European Union of the principles of the Aarhus Convention.

In addition to these financial changes in governance, there are three other factors that will determine the success of this scenario:

- First, international changes to the law of the sea and the oceans, leading to greater protection of marine biodiversity and the deep seabed, along with gradual recognition by the law of the legal personality of some remarkable natural elements. Eventually, the Mediterranean and some rivers will be given this status, increasing the scope for action by the international community, and Mediterranean regions and societies. In addition to these new rights of nature, will be the rights of future generations, which will be recognised and sanctioned by an international court, similar to the International Criminal Tribunals. The sea is considered the first commons to protect and promote, within the framework of a policy of shared sovereignty and involvement of all actors and societies, with the financial support of large international donors and private benefactors. It is declared an inalienable resource in space and time, requiring the revision of the concept of exclusive economic zones (EEZ). Existing international protocols are strengthened and appropriate enforcement resources are put in place.
- This change to the law is reinforced by a strong alliance between civil societies inside and outside the Mediterranean, and scientific communities. Across all Mediterranean countries, there is an emergence of multi-purpose observation systems, structured in networks, relying on NGOs and local scientific networks. The quality and credibility of these citizen-based networks remain variable, but they provide great services for monitoring environmental changes and alerts.
- Finally, a decisive factor is the establishment of a form of governance that builds closer links than over the past fifty years between the objective of protecting the sea and all developments upstream, on coastlines, islands and in catchment areas.

The synergy of these actions with the sea as a collective issue suggests that there could be a virtuous dynamic, but it is not enough. Within a decade, the positive results of this policy, which can be measured at sea and along the coasts, warrant the widespread adoption of this model by including the coastal strip and then the catchment areas based on the vital importance of preserving a healthy water cycle. After the first phase of the Mediterranean “rescue plan”, which focused on the sea itself, stakeholders involved in the project quickly decide on a second phase, focused on the catchment areas of all Mediterranean rivers. It becomes clear that restoring the good ecological status of the sea will only be achieved by improving the soil and land in catchment areas, and the quality of the water that flows into them. To achieve this, rural people and farmers are paid to restore agro-ecosystems and the associated ecosystem services. Heavy fines are imposed on polluters and substantial funding is made available to change polluting activities along rivers and their tributaries. Common-pool management bodies for these rivers, such as basin agencies, become common and are associated with sea management bodies. In a context marked by global warming and the widespread scarcity of water resources, the overall management of the water cycle in terms of quantity and quality becomes a central concern, with the systematic recycling of wastewater, good management of grey water and improved distribution systems to reduce leakage losses from 30% to 10%. On the Eastern shore of the basin, tensions over control of the region’s major rivers make this work more complicated. Nevertheless, over time, and thanks to the mediation of countries outside the conflict, tensions are eased and environmental negotiations see the advent of more peaceful management of water resources. The ecological

dimension is not forgotten, with policies for the “ecological regeneration of watercourses” and the reintroduction of species.

Land and marine environment

Global climate change is accelerating, with a land temperature rise of 2.5°C by 2050 in the Mediterranean, along with sea temperatures. This change had been predicted for a long time, and states and corporations respond in many ways: investments by nation states and major corporations in decarbonising the economy, radical changes through legislation (e.g. EU ban on the sale of new combustion engine cars starting in 2035). In Southern and Eastern Mediterranean countries, and Sub-Saharan Africa, cooperation plans aim to reduce dependence on fossil fuels, ensure mass investment in renewable energies (solar, wind, hydrogen), and train the entire skills chain in new technologies. But the mediocre economic situation and political and social constraints delay the implementation of these actions, and continue to marginalise climate and environmental priorities until the late 2020s.

However, the situation changes from the 2030s for two reasons: first, aggravation of the ecological situation and second, international mobilisation around the sea. Major disturbances affecting both marine and land ecosystems (drying out, soil erosion and salinisation, high tides, flooding, mega-fires, coastal erosion, water shortages, etc.) prompt the public authorities to take drastic measures. On an international scale, decarbonisation processes previously started and the re-carbonisation of the biosphere are financed by increasing taxation on carbon-based or polluting products. They are supplemented by a large number of programmes aimed at the sustainable management of ecosystems and resources, including the promotion of natural ecosystem services, agro-ecology and detailed water management. These developments align with the objective of protecting the sea and are gradually integrated into short supply chains and the circular economy, with waste recycling and the multiple re-use of water. Southern countries are often ahead when it comes to the common-pool management of water resources and the use of suitable species in agriculture. European experts come to train in the South, with widespread exchanges of practices and experiences between farmers on different shores of the Mediterranean, thanks, in particular, to the Internet.

The biggest change is that the production of ecosystem services by the sea and its coastline (46,000 km of Mediterranean coastline) up to the headwaters of catchment areas, become a collective priority for all Mediterranean countries. A coherent set of rules is adopted, starting from the achievements of the Barcelona Convention and its Protocols, which is enriched with more ambitious measures such as the expansion of Marine Protected Areas to more than 30%, then 50% of the maritime area and, above all, by providing the means to enforce these rules (surveillance, monitoring, legal proceedings, sanctions). Flotillas of patrol boats and drones are used in accordance with common intervention rules for all countries. Standardised measurement systems are installed on a wide range of infrastructure, such as buoys, offshore wind turbine mounts and ships of all sizes, with the call for participatory science at sea, particularly through amateur fishermen, pleasure boaters and offshore racers. A global data processing centre is set up in Malta in collaboration with REMPEC, a regional organisation that already monitors maritime pollution. This centralised management provides an overview of the state of the sea, reinforcing awareness about urgent issues that need to be dealt with, and the fundamental policies to be implemented. Soon enough, these efforts lead to regeneration of biodiversity and an enrichment of some ecosystems with the arrival of subtropical species via the Suez Canal, the Strait of Gibraltar and de-ballasting. Not all of these new species are invasive, i.e. they do not all have damaging effects on existing species. Some of them can even be exploited commercially. However, improved management of fisheries and the virtual eradication of illegal and unreported fishing are what keep fishing stable.

Similar efforts are made on land, especially through the ecological management of catchment areas and the development of local or regional cooperation mechanisms for agriculture and the protection of nature. Gradually, policies and forms of common-pool management tried-and-tested around or for the sea are extended within the various countries or regions. The success of this process sets an example for all regional seas and, by extension, for the world ocean in the long term.

This scenario starts with the worst before getting better. A simplified image would be to “hit rock bottom before bouncing back to the surface”. There are two advantages in terms of likelihood: first, it follows a more-or-less business-as-usual scenario in the first decade, making the situation leading to the reaction plausible by 2030. Secondly, it aligns with some current change dynamics (pressure from numerous NGOs for protection of the seas and oceans, gradual recognition of the rights of nature and of future generations), with a logical extension to a global scale.

However, despite these favourable factors, the scenario remains largely unlikely, because it requires the mobilisation of a very large number of actors at different levels, from the global to local levels (nation states, corporations, civil society, NGOs, public opinion), to make this a unifying global project that is economically viable and socially rewarding. Moreover, it would require sea quality to become a driver for change in all countries, which is far from true today. The resulting virtuous circle and its cascading effects are complex to implement, and this complexity makes it unlikely. The same is true of the institutional, legal and financial framework that needs to be implemented. Recent agreements on the restriction of sulphur and nitrogen compounds in ship fuel in the Mediterranean may pave the way for other major advances, within a truly sustainable blue economy. Despite this, all the transformations needed to move towards common-pool management in the Mediterranean would require the constant support of all stakeholders not to mention colossal funding, which is by no means a given. The scenario will also result in constraints that are difficult to overcome (e.g. standards, strong limits on resource extraction, etc.) and will necessarily come up against the inertia of any system and multiple interests hostile to any structural change. It does, however, represent a possible way out of the current difficulties and obstacles, and a utopia that mobilises actors and offers a kind of dream, which is an essential ingredient in triggering a desire for action and solidarity. Moreover, it is important not to overlook the significant co-benefits for key issues such as democratic systems, global management of the water cycle, waste reduction and the circular economy, and the emergence of a regenerative or symbiotic economy that puts life and biodiversity back at the heart of sustainability policies.

III. Summary and assessment of scenarios

The above scenarios anticipate six possible trajectories for development of the Mediterranean, both as a sea and a region, by 2050. They are unique in that they combine different contextual assumptions with specific configurations of public and private stakeholders. Although one of these scenarios can be considered a business-as-usual scenario (no. 1), their main purpose is not to say with certainty what the situation in the Mediterranean will be in thirty years' time, but to **open up possibilities** in the face of the likely prospect of significant aggravation of current problems and even potential exposure of the whole region to serious crises.

1. Analysis grid

These six narratives can be summarised and assessed in two ways: either as a whole, or by emphasising their differences.

With these two considerations in mind, an assessment table has been created for all the scenarios, based on a grid of ten criteria:

- initial global contexts,
- triggers,
- drivers of change,
- main actors,
- levers for action,
- ways of understanding the sea,
- opportunities and benefits,
- risks and weaknesses,
- preferred analysis logics,
- and finally, plausibility of the scenarios.

The results of this analysis are presented in the table below :

Scenario title	S1 - Inertia, marginalisation of the Mediterranean, and pragmatism	S2 - Colliding crises and forced adaptations	S3 - Growth at all costs in a fragmented Mediterranean	S4 - Euro-Mediterranean partnership for a blue-green transition	S5 - Another sustainable development model specific to the Mediterranean	S6 - The Mediterranean Sea, global commons
Initial global context	Economic or geopolitical difficulties, and climate and ecological policy inertia	Global crises, crossing of tipping points	Poorly regulated globalisation, decline of international institutions - Economic liberalism	Global digital economy (4.0) and global competition on green and blue technologies	Economic deglobalisation but sustainable development is a global priority	Alarming evolution of the climate and the state of ecosystems, especially oceans
Triggers	Progressive degradation in all sectors	Crises and conflicts over resources (especially water)	Will to solve unemployment in SEMCs, economic deregulation	Public pressure and EU initiative, success of the Green Deal	Awareness of the dead-ends of maldevelopment, and mobilisation of all stakeholders	Rapid degradation of the sea, mobilisation of global civil society
Drivers	Status quo and pragmatism	Strategies for survival and resilience in the face of crises	Economic development and competition - Southern countries catching up and wanting power	Blue-green transition based on digital technologies, new energies and ecological modernisation	Ecological emergencies and international pressures - Refusal to be dependent - Value changes and civil society activism	Care for a common good, start of a virtuous spiral
Actors	States, transnational corporations, lobbies, socio-economic elites	Failed states, violent groups, self-organised communities, local actors, insurance and risk management	States, BRICS, multinational corporations, national “champions”	European Community and Mediterranean Alliance, businesses (digital, energy)	Civil societies and territories - Sub-regional alliances - New multi-scale governance structures	International opinion and community, then all Mediterranean actors
Levers (themes and tools merged)	National support policies, business adaptation, institutional makeshift policies and social adaptation measures	National emergency measures, local resilience strategies, risk management	High growth policies, foreign direct investment - Increasing rentier revenues and comparative advantages	Technical progress, Euro-Mediterranean cooperation on digital technologies and energy - Economic incentives	North/South cooperation, intercultural dialogue and resource pooling - Long-term transition strategies and territorial planning	Protection measures to preserve the good ecological status of the sea, catchment areas, international taxes, new rights
Sea	Protection of emblematic species, general degradation of the marine ecosystem	A lawless space, ecosystem disruption	Area for economic trade, with no environmental protection	Intensive but sustainable economic exploitation, which is monitored	Local sea, a protected area for sharing between Mediterranean peoples	Global commons, the focus of all care
Opportunities and benefits	Development of the green economy, some successful adaptations (e.g. energy)	Local resiliencies, invention of new models - Opportunities for new political groupings	Economic development in the SEMCs, North/South rebalancing, jobs, potential investment	Green growth and Mediterranean leadership in the blue economy - Low sustainability	Cultural and economic renewal - Invention of an exemplary model of sustainable development	Laboratory and model for protecting regional seas, a common unifying objective
Risks and weaknesses	Political and social risks, irreversible environmental degradation - Marginalisation of the region - Growing gaps between promises and results	Decay of Mediterranean governance, failure of some states - Partial collapses	Unsustainability, growing inequalities	Inequalities produced by the transition, social protests, interference by the European Union and the risk of a persisting North/South divide	Vulnerability of the Mediterranean to climate change that it cannot control - Lack of consensus on conservation and resources for endogenous development (e.g. water)	Action focused mainly on the sea - External intervention seen as interference, resistance from lobbies, discrepancies between national policies, irreversibility of degradation
Analysis logic	Testing the inertia of the system to its limits and those of a wait-and-see	Considering resilience capacities after collapses	Testing the limits of the market economy and economic voluntarism. Going	Exploring the benefits (and weaknesses) of an eco-technological transition and possibilities for closer	Imagining a new sustainable development narrative for the region, and assessing	Testing a “radical” assumption to “save the sea” without imposing sustainable

Scenario title	S1 - Inertia, marginalisation of the Mediterranean, and pragmatism	S2 - Colliding crises and forced adaptations	S3 - Growth at all costs in a fragmented Mediterranean	S4 - Euro-Mediterranean partnership for a blue-green transition	S5 - Another sustainable development model specific to the Mediterranean	S6 - The Mediterranean Sea, global commons
	attitude, and room for manoeuvre for pragmatic policies		deeper into growth-environment interactions	ties between the European Union and the Mediterranean	its strengths and limitations	development on the entire region
Plausibility	High (business-as-usual)	Medium	Medium	Medium	Low	Low

Table 8. Summary table of scenarios

2. Overview.

- The first question raised by this set of scenarios is how representative they are. Starting with over thirty variables and many more assumptions about their development, representing a very large number of possible combinations, no foresight method can guarantee the production of all possible scenarios that are the most representative of future development. By combining two complementary approaches, both based on the same table of variables, the scenario building method has been designed to guarantee satisfactory representativeness. In hindsight, and on reading the summary table, it is clear that the six scenarios adequately meet the initial specifications. They also cover most possible choices in key areas such as the international context and its impacts on the region, the place of the environment in development, whether or not there is cooperation between Mediterranean countries, technical choices or intervention tools, and modes of governance. A desire to be representative of the main possible trajectories between now and 2050 also explains the number of scenarios.
- The first three scenarios can be considered “pessimistic” and the last three “optimistic”. This is not for the sake of balance. There is no such thing as an entirely “bleak” or entirely “rose-tinted” scenario. First, we already know that whatever scenario occurs or is favoured, the region’s environment and sea will be exposed to very strong pressures linked to climate change (with a minimum of 2°C warming by 2050) and major demographic changes (very different in the North and South). Secondly, the scenarios are not only designed to highlight risks or opportunities, but also to draw lessons from them for public policy adaptation. As the penultimate line of the table shows, each scenario leads to questions associated with public policy:
 - what room for manoeuvre is there for pragmatic policies in a future context of widespread obstacles - and to what extent can a wait-and-see approach be a solution? (Scenario 1);
 - how can one prepare for serious crises and build capacity for resilience? And to what extent will these colliding crises trigger major changes between now and 2050? (Scenario 2)
 - what environmental aspects can be preserved in the long term or financed in proactive strategies for strong growth? (Scenario 3)
 - is there room for a green and blue technological transition in the Mediterranean, driven by the European Union, and what are its limits? (Scenario 4)
 - is there a possible pathway towards a specific Mediterranean model of sustainable development, and under what conditions could successful local or extra-local experiences and innovations be mainstreamed with this in mind? (Scenario 5)
 - can the Mediterranean Sea be saved in the long term without imposing a high level of sustainability on the entire region and thanks to the mobilisation of the global community? (Scenario 6)

All these questions, which are only raised in the scenarios, will have to be addressed again, at the level of the Mediterranean sub-regions, in the final phase of MED 2050, which is dedicated to transition strategies.

3. Points of comparison

To account for major uncertainties up to 2050, and by methodological design, the *six scenarios are highly contrasting*, with contexts, triggers, drivers of change, stakeholders and levers that differ profoundly from one another. This does not rule out certain common points (climate and demographic pressures, the omnipresence of water-related issues, the growing dependence of the Mediterranean on the global context, the digital transition, etc.), but it does show *that there may be a number of possible futures over the next 30 years - with very different consequences for the environment and the sea.*

In terms of *plausibility*, Scenario 1 (“Inertia, marginalisation of the Mediterranean, and pragmatism”) is the most likely and can be considered the business-as-usual scenario. The other two scenarios showing a degraded situation (“Colliding crises forced adaptations” and “Growth at all costs in a fragmented Mediterranean”) have a medium level of plausibility. Regarding the “positive” scenarios that lead to an improvement, only Scenario 4 of a “Euro-Mediterranean partnership for a green and blue transition” also has a medium level of plausibility, as the final two are considered fairly unlikely.

In conclusion, a number of more specific comments can be made about these different scenarios:

- A wait-and-see attitude and a policy of taking small steps is not a stable or sustainable solution in the long term, as Scenario 1 risks a rapid transition into Scenario 2 (“Colliding crises”) or Scenario 3 (“Growth at all costs”) for opposing reasons.
- After the turbulence already seen in recent years (COVID, international tensions, climatic events, etc.), the priority now more than ever is to prepare for unforeseen situations and to initiate policies for climate change adaptation and the prevention of major risks;
- The Mediterranean region will increasingly be unable to rely solely on its own strength to overcome the challenges it faces. Virtually all the scenarios show that the region is highly dependent on the outside world, in a wide variety of forms (climate change, standards, technologies, financial contributions, etc.), which highlights the importance of the region’s active involvement in international policies, both at a global level and in neighbouring regions, such as Europe, Africa or the Middle East;
- All the sustainable development scenarios require new forms of cooperation to be established, whether North-South (Scenario 4, and partially Scenario 5), South-South (Scenario 5) or between the Mediterranean and the global community (Scenario 6). More broadly, innovations in governance are one of the keys to future transitions.
- Finally, although the obstacles currently preventing rapid progress towards sustainable development of the Mediterranean and preservation of the sea appear to be significant (see Scenario 1), there is still plenty of room for manoeuvre to make progress - innovations in governance and cooperation, technologies, diversification of development models, economic incentives, law enforcement or changes to laws, mobilisation of international funding, involvement of territories and civil society, changes in values and lifestyles, etc. There is no choice but to be proactive and to define transition pathways in order to organise the mobilisation of these different resources in a way that is fair and adapted to each territory.

Conclusion

Barring any major shifts, by 2050, the Mediterranean Sea and Region will be in a far more alarming situation than today, with the risk of having to deal with a combination of serious crises²¹. In addition to the internal causes of this situation (demographic, socio-economic, geopolitical or governance-related), the region's vulnerability and dependence on external factors over which it has insufficient control also need to be taken into account, such as the climate.

To help Mediterranean stakeholders avoid this foreseeable path and guide long-term policies for the protection of the marine ecosystem and the transition to sustainable development in the region, MED 2050 has explored futures of the Mediterranean Basin as openly and systemically as possible. The purpose of this exercise was not limited to providing a few (essentially qualitative) insights into what the Mediterranean will look like in 2050. It has also set itself the objective of proposing various pathways for overcoming the obstacles and crises (which are foreseeable today) and for initiating the medium- and long-term transitions and action plans needed for sustainable development in all parts of the Mediterranean, and for achieving the SDGs.

With this in mind, MED 2050 has used a tried-and-tested methodology to assess the key issues for the future, rank and quantify certain trends, identify possible disruptions, collect the visions of Mediterranean stakeholders and, finally, map out potential alternative trajectories. Taken together, all these intermediate outputs, along with the detailed analyses carried out on 36 variables, constitute a useful resource for Mediterranean actors in their future policies.

The six scenarios that have emerged from this foresight approach at the heart of this report already provide an initial response to the question of the transitions that need to be made for the long term. They propose possible trajectories and the essential conditions for their successful implementation. But this is still expert work that needs to be discussed and continued with the actors involved. The operational resources required to achieve their objectives or avoid their consequences need to be addressed in greater depth, and more specifically in each sub-region, involving all diverse actors at different levels. This additional stage will also make it possible to overcome the limitations encountered during the implementation of the exercise, particularly with regard to the stakeholder consultations planned in the initial methodology.

Therefore in 2024, a complementary phase is envisaged to promote and deepen MED 2050, with the aim of mobilising various actors and stakeholders from around the Mediterranean, both to debate the scenarios developed as part of MED 2050 and, based on current situations, to reflect on the short, medium and long-term actions needed to move towards the desired scenarios, and to avoid or anticipate those considered unacceptable.

With this in mind, two approaches are proposed. First, active consultation with stakeholders in the various sub-regions: North, South and East, through workshops involving actors including decision-makers, institutional representatives from international organisations, and international and regional cooperation institutions, along with members of the foresight group and the steering committee. Second, the involvement of Mediterranean actors at a national level or within local authorities, such as entrepreneurs, representatives of state administrations and/or institutions, national cooperation organisations, local authorities, non-profits and/or civil society, etc., through local or national workshops.

In these workshops, priority should therefore be given to developing and comparing different transition pathways, taking into account specific sub-regional, national or local characteristics, and realistically identifying the means, opportunities and obstacles to achieving them. MED 2050 is considered in this way to have an eminently strategic vocation and should be able to help decision-makers build and evaluate the pathways or strategies needed to achieve shared objectives in a context of uncertainty.

In the same way, the MED 2050 foresight exercise could make a significant contribution to the future edition of the Mediterranean Strategy for Sustainable Development, with the substantial involvement of the MCSD in this last chapter of the MED 2050 programme dedicated to building transition pathways for sustainable development in the Mediterranean.

²¹ See Scenarios 1: "Inertia, marginalisation of the Mediterranean, and pragmatism" and 2: "Colliding crises and forced adaptations".

Appendices

Appendix 1 : List of experts supporting the permanent members of the foresight group for the Module 1 (The foresight base).

Appendix 2 : List of variables studied as part of MED.

Appendix 3 : The morphological chart

Appendix 1: List of experts supporting the permanent members of the foresight group

Experts in support to the Foresight Group	
Name et surname	Organisation
ABIS Sébastien	Club DEMETER, IRIS, Futuribles
APPRIOUAL Antoine	European Institute of the Mediterranean (IEMED)
AROUA Najet	Polytechnic School of Architecture and Urbanism
ATTIA Khalil	UNEP/MAP-SPA/RAC
BABOCI Joni	Tirana City
BADUEL Marie	AViTeM
BENAISSA Amine	Sorbonne University
BEN CHARFI Khouloud	Water Youth Network
BEN JANNET ALLAL Houda	MEO (Mediterranean Energy Observatory)
BERTHOD Justine	LITTOCEAN
BEURRIER Anne Gaëlle	LITTOCEAN
BLANC Pierre	Sciences Po Bordeaux / Ecole Nationale des Sciences Agronomiques Bordeaux
BOCCI Martina	t-ELIKA
BOUT Céline	European Environment Agency (EEA)
BOUTRY Nolan	Tour du Valat
BRÉCHON Pierre	Sciences Po Grenoble
BRUNFAUT Victor	Université Libre de Bruxelles
BURDY Jean-Paul	Sciences Po Grenoble
CARIC Hrvoje	Tourism Institute, Zagreb
CASTILLO Paula	Eco-Union
CEBRIAN Daniel	UNEP/MAP-SPA/RAC
CHERKAOUI Hakim	ENA Rabat
COSTA SALAVEDRA Cristina	Eco-Union
CURY Philippe	IRD/Clora
DAGUZAN Jean-François	Strategic Research Foundation
DE DINECHIN Frédéric	Banque de Développement du Conseil de l'Europe
DEL MAR OTERO Maria	IUCN Centre for Mediterranean Cooperation
DORANGRICCHIA Anna	Union for the Mediterranean
EL ASMI Souha	UNEP/MAP-SPA/RAC
EL ASRI Ouissame	Aix-Marseille University
EL BARDAOUI	Tunis University
FABIAN Lorenzo	University IUAV of Venice
FATOUX François	Senior Consultant in Diversity and Corporate Social Responsibility
FERNANDEZ BAYO Ignacio	Spanish Association of Scientific Communication
FERROUKHI Sid Ahmed	ENSA/CREAD
FOUCHIER Vincent	Métropole Aix-Marseille-Provence
FRANCESCUTTI Pablo	Rey Juan Carlos University
GALEWSKI Thomas	Tour du Valat
GONTHIER Frédéric	Sciences Po Grenoble - Pacte
GONZALEZ Gabino	REMPEC
GUTERMAN Ofer	BDO Consulting Group
GUZZON Claudia	CPMR
HASSOUNI Fatiha	Danish Human Rights Institute
HEMA Tatjana	PAM Coordination Unit
HODEBERT Laurent	ENSA Marseille
JARDINÉ Dominique	Région Sud - Provence Alpes Côte d'Azur
KHAMLICHI Hajar	Mediterranean Youth Climate Network
LAMINE Sihem	Harvard University
LAUWERS Franck	REMPEC
LAZARO Lourdes	IUCN Centre for Mediterranean Cooperation
LIMAM Atef	UNEP/MAP- SPA/RAC
LOURS Xavier	Métropole Aix-Marseille-Provence
MARINI Katarzyna	MedECC

MAROT Bruno	Sciences Po, Ecole d'Urbanisme de Paris
MARTIN Marianne	AViTeM
MATTEUDI Emmanuel	LIEU - Aix-Marseille University
MAZZUCCHI Nicolas	Foundation for Strategic Research
MEUNIER Philippe	AViTeM
MONEER Aziza	American University of Cairo
NEGEV Maya	Haifa University
NIKOPOULOU Konstantia	MEDCITIES
NUMA Catherine	IUCN Centre for Mediterranean Cooperation
ODIN Stéphanie	Région Sud - Provence Alpes Côte d'Azur
OUERGHI Atef	UNEP/MAP-SPA/RAC
OUTTERS Magali	UNEP/MAP-SCP/RAC
PICART Anaïs	Eco-Union
QUERALT BASSA Arnau	Consultative Council for Catalonia Development
RAHMOUNI BENHIDA Bouchra	Africa Business School
RAMIERI Emiliano	Marine Spatial Planning Network
RANDONE Mauro	WWF MedPO
RODRIGUEZ Josep	Sustainable Tourism Community
SANALAN Teoman	European Environment Agency
SCHRÖDER Christoph	ETC-UMA
SCOULOS Michael	Athens University, MAB/Unesco Greek National Committee
SEGHIRATE Yasmine	CIHEAM
SFEIR Christiane	Faculty of Fine Arts and Architecture - Lebanese University
SIMARD François	Consultant
SLAOUI Younés	Odyssey International
SMAOUI Malek	REMPEC
SOOS Timotej	Ministry of Foreign Affairs of Slovenia
SUAREZ de VIVERO Juan Luis	Seville University
TAJE Mehdi	Tunisian Institute of Strategic Studies
TALOTIS Constantinos	Cyprus Institute
TEIXIDOR-COSTA Arnau	IUCN Centre for Mediterranean Cooperation
TROYA Antonio	IUCN Centre for Mediterranean Cooperation
TSAKAS Constantin	World Bank
TURKI Yassin	Carthage University
ULRICH Clara	IFREMER
VAUZELLE Sébastien	UNDP
VAZ Sandrine	IFREMER
VLACHOGIANNI Thomais	MIO-ECSDE
VOIRON Christine	Nice University
YAZIGI Serge	Yazigi Atelier
ZIMMER Daniel	Climate-KIC
ZOVIGHIAN Diane	World Bank

Appendix 2: List of variables studied as part of MED

- FS²² 1:** Major global trends (Megatrends) up to 2050 and their consequences for the Mediterranean
- FS 2:** Mediterranean identities
- FS 3:** Geopolitics and security in the Mediterranean
- FS 4:** The place of the Mediterranean in European policies and the Green Deal
- FS 5:** Public and private financing of development in the Mediterranean. What role for Green Finance?
- FS 6:** International governance of the marine environment in the Mediterranean between crisis, continuity and transformation. Evolution and application of the law of the sea and national ownership of maritime spaces
- FS 7:** Population growth in the Mediterranean
- FS 8:** Presence, origin and destination of migrants in the Mediterranean. Trends and perspectives
- FS 9:** Urban transitions in the Mediterranean and their consequences on the environment: urbanisation, urban-rural balance, effects on waste, land ownership, pollution and resources
- FS 10:** Concentration of human activities in coastal and sea areas: competition, cumulative effects and risks
- FS 11:** Climate change and its impacts on land and sea
- FS 12:** Adaptation issues and policies, between vulnerability and resilience
- FS 13:** Changes to greenhouse gas emissions and mitigation policies
- FS 14:** Transformations of the Mediterranean ecosystem and its impact on marine and coastal biodiversity
- FS 15:** Exploitation and ownership of Mediterranean marine mineral and energy resources (gas exploitation, deep sea mineral resources, renewable energies, etc.). The consequences of offshore expansion
- FS 16:** The future of fisheries and aquaculture in the Mediterranean and its impacts (ecological and social impacts, etc.)
- FS 17:** The evolution of “living” resources and natural biodiversity on land
- FS 18:** The water-soil-agriculture-environment nexus
- FS 19:** Energy transition in the Mediterranean region - towards climate neutrality
- FS 20:** Economic growth dynamics
- FS 21:** The knowledge society
- FS 22:** The blue economy: opportunities, obstacles and risks
- FS 23:** Maritime transport, port infrastructure in the Mediterranean, international trade and pollution related to these activities
- FV 24:** Tourism and tourist mobility: future prospects and impacts of these activities on the environment and coastal and regional economies
- FS 25:** Inequalities, poverty, changes to social mobility, informal economy and solidarity system: towards an increase in social divisions ?
- FS 26:** Changes to the value system and religiosities
- FS 27:** The place of young people in society and intergenerational relationships, youth employment and care for the elderly.
- FS 28:** The situation of women in the Mediterranean
- FS 29:** Modifications in production and consumption patterns
- FS 30:** Role and development of civil society in public policies
- FS 31:** Risk and crisis prevention: anticipation, public action and collective resilience
- FS 32:** Multi-scale and multi-actor governance
- FS 33:** Environmental awareness: the role of the media and civil society organisations
- FS 34:** Policy coherence and regional cooperation for sustainable development
- FS 35:** Water resource management
- FS 36:** Observation, monitoring and warning systems in the Mediterranean

²² FS : Factsheet

Appendix 3: Morphological chart

Component: Context – Disruptions	Assumption 1	Assumption 2	Assumption 3	Assumption 4	Assumption 5
Major global trends for 2050	Sino-American diarchy	“Open World 4.0”	A world of fortresses	A multi-polar world	Global mobilisation for sustainable development
The Mediterranean in the global context	Status quo and “Battlefield”: National isolationism and stagnation	Crises, profound destabilisation and resilience	Recomposition of the Mediterranean space into large “centrifugal” sub-regions	Successful adaptation to globalisation (technological and ecological)	Co-construction of a (sustainable) development model specific to the diversity of the Mediterranean
Global climate scenarios (IPCC)	Target rise of 1.5°C by 2100 (2°C by 2050 in the Mediterranean)	Carbon neutrality in 2050 (+2°C by 2100) (2°C by 2050 in the Mediterranean)	Business-as-usual: +3°C to +3.5°C by 2100 (2.3°C by 2050 in the Mediterranean)	Climate chaos: tipping points exceeded (2.8°C by 2050 in the Mediterranean)	Successful climate engineering and maximum efficiency of carbon sinks
Component: Demographics	Assumption 1	Assumption 2	Assumption 3	Assumption 4	Assumption 5
Population growth	Business-as-usual. + 130M in the South & East, - 10M in the North and general ageing	High assumption: higher-than-expected fertility in the South & East (+165M) and faster decline in the North (-25M)	Low assumption: faster-than-expected demographic transition in the South (+85M)		
Migration dynamics in the Mediterranean	Reduction of migration needs at source. North-South co-development	Chaos: exponential increase in climate flows and refugees	High population mobility (economic needs)	Closure of countries and quota policies	Ambiguities, illegal migration and make-shift policy
Component: Environment	Assumption 1	Assumption 2	Assumption 3	Assumption 4	Assumption 5
Concentration of human activity in coastal areas and at sea	Effective spatial planning, protection and land-use planning at national and local levels	Coordinated withdrawal to the hinterland and coastal protection	Uncontrolled coastal development with protected enclaves for the elites. Increasing reclaimed land from the sea	Uninhabitable and deterrent coastline (urbanisation, climate, etc.)	Coastline at the service of the sustainable blue economy
Climate change and its impacts on land and at sea	Strong mitigation and adaptation policies: Green Deal in the North and strong investment in the South	Carbon neutrality not achieved by 2050, mitigation and adaptation uneven depending on countries	Poor mitigation in the Mediterranean and worldwide, but local adaptations based on vulnerabilities	Poor adaptation and mitigation, and risks of local disengagement or collapse	Diplomatic action by Mediterranean countries to strengthen global policies
Transformations of the Mediterranean ecosystem and impact on marine and coastal biodiversity	Marine ecosystems undergo structural transformation (massive disruptions linked to climate change, tropicalisation, etc.)	Biodiversity and marine ecosystems under pressure. Protection limited to Marine Protected Areas and emblematic species	Species replacement and new ecosystems (very contrasting trends: depending on the species and sub-regions)	Successful ecological transition, strong protection of marine biodiversity and control of catchment areas	Diversification and enrichment of ecosystems, resulting in increased overall productivity
Changes in land resources and biodiversity	National or local “mining” policies: the economy and local security take precedence over environmental protection	Globalisation of trade and exploitation of export-related resources (timber, rare species, nature tourism, pharmaceuticals, etc.)	Priority to local sustainability, from a utilitarian, social and cultural perspective. Managing nature as a commons	Global sustainable development: international regulations and pressure from NGOs to protect hotspots and emblematic species	“Ecosystem services”, economic valuation and regulation of biodiversity: carbon or emissions markets, offsetting

Soil-water-agriculture-environment system	Major food, agricultural and environmental crisis, particularly in the South	Successful adaptation thanks to strong territorial specialisation of agriculture. Consideration of local ecological and competitive conditions	Successful adaptation thanks to widespread technological advances, particularly in digital technologies, and investment in water	Coexistence of different agricultural and food systems (subsistence, industrial, agro-ecological, etc.)	Proactive policies to reduce food dependency
Water resource management	Innovation, efficiency and control, but without changing behaviour thanks to technology and the reduction of waste	Increasingly sustainable behaviour in the North and South, and policies for equal access to water or common-pool management of resources	Business as usual: poor control of demand, pressure from economic uses, privatisation, technical solutions (desalination, etc.) leading to conflicts and degradation of resources	Management based on necessity or survival, with little cooperation or investment. Retreat to local subsistence farming and resilience	Chronic water crises with permanent water stress and “super-droughts” leading to migration and conflicts
Component: Governance	Assumption 1	Assumption 2	Assumption 3	Assumption 4	Assumption 5
Geopolitics and security in the Mediterranean	Cooperation and alliances of various shapes and sizes, and structural instability between states	Mediterranean renewal with Europe or the SEMCs as major geopolitical players, and North-South cooperation	Anarchic breakdown of the Mediterranean political system and marginalisation of the Mediterranean on the international stage	The Mediterranean is the backdrop for secondary conflict by the major powers via local conflicts	Pax Americana
Place of the Mediterranean in European policies and the Green Deal	A happy marriage between Europe and the SEMCs: global technological and political cooperation around the Green Deal	Sluggish duo: continuation of neighbourhood policies based on economic cooperation	Stronger but fluctuating cooperation on some themes (energy, etc.) and between certain countries	Isolationism of Northern Europe and marginalisation of the Mediterranean in European policies	Extension of the Europe of 27 to include some Southern and Eastern Mediterranean countries, or a Euro-Mediterranean market
Governance of the marine environment, between crises, continuity and transformations	Barcelona Convention and national, European or global regulations called into question or not enforced	Status quo: positive but slow change in the current situation	Sustainable development and multilateral governance under the aegis of international organisations, new law of the oceans and the sea	The Mediterranean Sea as a commons protected by mobilising civil society, the public and scientists	Governance based on sub-regional or national institutions
Urban transitions in the Mediterranean and their impact on the environment: urbanisation, urban-rural balance, effects on waste, land-use, pollution and resources	Three-tier commodified (or neoliberal) metropolis in a fragmented Mediterranean	Cities in ecological and post-carbon transition and collaborative territories on a Mediterranean scale. Networks of transitional and resilient cities	Urban collapse, resilience and protected enclaves. Failure of public action leading to informal modes of self-organisation	Acceleration of the urban transition in Southern countries, with populations concentrated in metropolitan areas. Convergence of urbanisation and metropolisation rates between North and South	Revival of medium-sized towns and “urban exodus”, thanks to remote working

Adaptation issues and policies, between vulnerability and resilience	Public awareness raising and development of a risk culture	Economic regulation through insurance and international aid (from North to South). Public compensation for damage	Decentralised management of adaptation by territories and land-use planning and resilience policies	Investment policies (dykes, etc.) targeting the most vulnerable areas, populations and infrastructure	Anticipating the impacts of climate change on activities and ecosystems, and active transition strategies
Changes to GHG emissions and mitigation policies	Very little investment from national policies, marginally offset by local and private efforts	Mitigation policies conditioned by their economic and technological benefits	Successful energy transition in national policies (North and South) beyond the Paris Agreement. Carbon neutrality almost everywhere by 2050	Rapid mitigation in the North and slow in the South	North-South cooperative strategy: mass financial transfers, joint investments, Mediterranean Green Deal
Energy transition: towards carbon neutrality in Mediterranean countries	Rapid energy transition, but differentiated according to each country's strengths (solar, carbon sinks, etc.), with priority given to technology (renewable/nuclear/hydrogen mix)	A wait-and-see attitude, opportunism and scattered efforts. Slow progress, with empty promises	Continued priority for fossil fuels and the exploitation of gas and oil resources in the Mediterranean, including offshore	A coordinated strategy in the Mediterranean for a comprehensive transition. Technological cooperation, joint financing, network interconnection	Disruptive strategy: priority given to sobriety and a fair transition. Changing lifestyles and consumption patterns, controlling prices for the most vulnerable, energy planning
Role and development of civil society in public policy	Minor role: low political recognition and inability to mobilise public opinion or take effective action	Influential role Civil society plays its part in many bodies and makes its voice heard in a growing number of decision-making processes	Major role Civil society replaces public authorities in the management of many problems, and becomes a permanent actor in political life and international action	Controversial and heterogeneous role depending on the country: civil society makes its voice heard, but in a confused manner, with many pressure groups with disputed objectives and representativeness	Role of opposition: growing conflicts opposing civil societies with local or national institutions
Risk prevention (natural, agricultural, industrial, digital) and crisis situations	Ambitious multilateral and territorial risk reduction and resilience policies based on shared resources and a democratic risk culture	Technocratic and private risk management: failure of public preventive measures and security entrusted to corporations and insurance companies	No anticipation of risks, just emergency management of crises and accidents. The most vulnerable territories are abandoned	Risks as geopolitical weapons. The rule of every man for himself, even at the cost of disaster for everyone	Maximum pooling of risks on a Mediterranean scale in order to reduce costs, including prevention. North-South solidarity
Multi-scale, multi-stakeholder governance, particularly of the sea and coastline	Status quo Large diversity of institutional situations, but shared problems associated with state authority, international law enforcement and	Major and general crisis of governance. The weakening of states, decline in budgetary resources, and influence of lobbies lead to international	Priority to law enforcement: international law is integrated at all levels	Institutional innovations move towards greater decentralisation and common-pool management, with priority given to capacity building	Networks of territories, associations and public or private actors reinforcing multi-scale governance. Experience sharing and a shared culture

	sharing of roles with local authorities	conventions and ecological standards being called into question			of sustainable development
Policy coherence and regional cooperation for sustainable development	Status quo: silo policies and moderate coordination of national policies. Project rationale and a functional approach to coordinating international policies	General or partial collapse of governance : Absence or serious decline in policy coordination within and between countries	Growing political conflict over priorities. Strong focus on cooperation and coordination in a few “vital” areas (energy, transport, water, fisheries or food security)	Competition and nationalist isolationism: high levels of internal policy coordination but little cooperation even at EU level.	A comprehensive and effective Mediterranean policy for sustainable development (SDGs), with planning, strong cooperation and evaluation of results. Strengthening of the MCSD
Component: Economy	Assumption 1	Assumption 2	Assumption 3	Assumption 4	Assumption 5
Public and private financing for development in the Mediterranean. What role for Green Finance?	Financing limited to profitable projects or offsetting markets, and greenwashing	Financial and budgetary crises, and refocus on short-term emergencies. Community solidarity	Strong green conditions tied to public and private funding. Removal of subsidies for unsustainable activities	Abundance and diversity of green financing, with priority given to vulnerable countries and populations and small-scale projects. Acceptance by Northern countries to pay for the South	Strong greening of finance and aid, but focus on attractive countries and projects
Exploitation and ownership of marine mineral and energy resources in the Mediterranean	Slow transition to sustainability: active Euro-Mediterranean cooperation for a sustainable blue economy, but with co-existence of traditional polluting sectors	Incentives or cooperation for profitable “blue” investments (new technologies, marine energy, etc.)	North-South divide: differentiated policies in the North (move towards sustainability) and South (development of oil and gas industries)	“Mining” of available resources and competition for access to new resources through international investment	Strong sustainability policies and tighter constraints on all marine activities under international law
Futures of fisheries and aquaculture and their impacts	Business-as-usual scenario: slight decline in fisheries, slowly replaced by aquaculture Fisheries: 1 M t. Aquaculture: 2.5 M t	Disruption of ecosystems and rapid decline in fisheries, which is replaced by aquaculture, and conflicts of use Fisheries: 0.5 Mt. Aquaculture: 3 Mt.	Climate change co-adaptation without disrupting ecosystems, stable fisheries and rapid development of aquaculture Fisheries: 1.5 M t Aquaculture: 4 M t.	Slight improvement in both fisheries and aquaculture Fisheries: 1.2 M t. Aquaculture: 3 M t.	Disruption with a rapid decline in fisheries and severe restrictions on aquaculture: Fisheries: 0.5 M t. Aquaculture: 1.5 M t.
Economic growth dynamics	Continuation of 2010-2020 trends, with moderate growth in the North and stronger growth in the South and East, but without them catching up. Dual economies with high levels of informal work in the South and East	Rentier exploitation and comparative advantages (labour costs, resources, specialisations, etc.) with a view to strong growth and job creation. International investments	Structural slowdown linked to the region’s economic marginalisation, debt and a succession of crises, including the climate crisis.	Green and blue transition and cooperative development between Europe and the SEMCs, focused on technological innovation, digital technology, the blue economy and the energy transition	A specific and autonomous Mediterranean economic model for sustainable development. Diversity of trajectories with reduced dependencies

The sustainable blue economy: opportunities, obstacles and risks	Strong development with a clear definition of the ecological conditions for a “blue economy”. EU-MED co-development	Weak economic dynamism due to a lack of capital and tensions or crises in the Mediterranean	Heterogeneity of progress linked to national or economic interests and a competition rationale.	The blue economy is a soft power issue for the major powers. The environment takes a back seat	Sluggish economy and lack of innovation in the region, leading to the protection of traditional sectors
Maritime transport, port facilities in the Mediterranean, international trade and pollution linked to these activities	Exemplary Mediterranean: carbon-free transport, resizing of cruise ships	Congested motorway: transport expands despite growing security and pollution problems	A marginalised sea: fall in transport, especially linked to competition, new routes through the Arctic, and a decline in cruises and oil transport	The sea as an instrument: strong North-South differences. Foreign-controlled mega-ports in the South with no local benefits. Minimalist legislation	A local sea: priority given to local transport and cabotage. Maritime transport offsets a lack of land-based infrastructure and develops for reasons of regional cooperation
Tourism and tourist mobility: future prospects and impacts of these activities on the environment and coastal and regional economies	Covid forgotten: restoration of past dynamics with almost no progress on sustainability	Sustainable development and strong diversification of activities and areas dedicated to tourism. Shift away from tourism as the sole economic activity	Two-speed tourism: the rich in preserved areas and the poor in low-cost destinations	“MED Disney”: artificial recreation of historic sites, hyper-managed concentration of large flows, and museum-based or virtual nature	Tourism in decline due to climate change. Low-season tourism
Inequalities, poverty, changes in social mobility, the informal economy and the solidarity system	The 1% and no trickle-down effects: exacerbation of inequalities and policies with minimal redistribution. Development of informal solidarity networks	“Tax the rich!” and tax evasion. Introduction of disruptive tax systems on capital and strong redistribution, which is hampered by tax evasion	Attractive policies based on fiscal and social dumping that increase poverty and inequality. Further decline in public services	Social collapse and revolt in some countries. Popular movements of tax refusal or protest leading to “populist” social measures	Structural reforms of tax and social security systems to guarantee a minimum income and transfer taxes on labour to the environment
Changes to production and consumption patterns	The economy at the expense of sustainability. Inertia in behaviour and reuse of waste	Regulation by the market, costs and technical innovation	Public constraints and incentives hindered by inequalities in social and geographical situations	Sobriety rather than growth (coordinated transitions at national and international levels)	Changes in values and local, community or individual initiatives. Territorial transitions
Component: Societies	Assumption 1	Assumption 2	Assumption 3	Assumption 4	Assumption 5
Mediterranean identities	The Mediterranean as a uniting force, a common identity based on culture and the sea	The Mediterranean, as a link between Europe and Africa	Fragmentation and isolationism around sub-regional and national identities	The Mediterranean divide: growing distance between North and South	Diluted identities in a “globish” culture
Trade-off of values between economics and ecology	Greed, priority to the economy and indifference to the environment	Growing awareness of risks and cost/benefit trade-offs	Growing North-South contrasts in an unfavourable environment	Ecological values as the norm and a shift towards post-growth. New indicators of well-being and wealth	Slow adoption of sustainability in line with socio-economic or generational change
Changes in the secular and	Individualism, slow liberalisation of	Reinforcement of North-South	The rise of populism, the	Positive community values around	Growing individualism and

religious value system	morals: decline in the role of religions and acceptance of cultural diversity	cultural divides: strong religiosity in SEMCs contrasting with growing atheism in the North	instrumentalisation of religions and the weakening of democratic values	common goods (autonomous management collectives)	retreat into the private sphere. Mainstreaming of liberal values
The place of young people in society and inter-generational relations. Employment for young people and care for the elderly	Revolution and secession among young people and a growing generational gap	The economic imperative takes precedence: high mobility and migration for jobs	“No Future”: Perception of young people as the first victims of climate change and socio-economic changes	Youth left to their own devices: civic withdrawal and self-organisation	Renewal from young people: A driving force behind societal change and the fight against climate change
Women in the Mediterranean	Growing tensions in relations between women and men despite partial progress: continuing inequalities and failure of public intervention	Ambitious policies to reduce gender inequality and the differences between North and South	False parity between men and women: quotas and gender bashing	U-turn: backward steps for women's rights in certain countries against a backdrop of radicalism	Over 25% employment rate for women in SEMCs
Greater environmental awareness: the role of the media, governments and civil society organisations	Strong North-South differences: more media involvement in the environment in the North, intermittent in the South.	Significant progress in awareness-raising: everyone involved in environmental information and policy of transparency	Scrambled messages: controversy and misinformation hamper progress in awareness-raising	Denial and censorship of ecological information: NGOs controlled, journalists monitored, scientists criticised	Pressure and influence of international news
Component: Technology & Science	Assumption 1	Assumption 2	Assumption 3	Assumption 4	Assumption 5
Innovation policies in the Mediterranean	Marginalisation and dependency of the Mediterranean. Region falls further behind in digital technology, research and training	Intentional and national (or regional) specialisations. National champions	Digital and knowledge-based societies	Mediterranean innovation space focused on digital technologies, the blue economy and the energy transition	Creative and attractive territories. Hubs for positive and low-tech innovation
Observation, monitoring, warning systems	Fragmentation of observation, monitoring and warning systems, except in European countries	Citizen science and strong involvement of civil society in environmental and information issues	The era of Big Data 2.0, shared, standardised and connected under the control of public state agencies, research centres or international commissions	High-performance private observation and monitoring systems (GAFAMs and Asian operators), but developed for economic rather than ecological reasons	Collection and publication of information for political needs (SDGs, etc.). Role of international institutions (UN, EU, etc.)