

TRITON

Development of management tools and directives for immediate protection of biodiversity in coastal areas affected by sea erosion and establishment of appropriate environmental control systems.



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Technical support

















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TRITON

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ABSTRACT

The management of coastlines must combine the use of coasts with the protection and conservation of habitats and ecosystems. Coastal planning can play a central role in the fight against coastal erosion and in the reduction of anthropogenic pressure; thus, it can prevent the depletion of coastal habitats and facilitate natural forms of coastal adaptation that intense human activities preclude.

The thematic regulatory framework at international, European, Italian and regional level (Puglia) on the use and conservation of coastal areas has been outlined, focusing on spatial planning coastal areas. Therefore, Protocol VII of the Barcelona Convention on Integrated Coastal Management (ICZM 2008), Marine Strategy, Maritime Spatial Planning which is a key tool to implement blue growth and is closely linked to the Marine Strategy - and the Protocol on Integrated Coastal Management, as well as rules on the protection and use of the coast in Apulia, have been studied in depth. The European Union Strategy for the Adriatic and Ionian Region (Eusair) involves 9 countries (4 EU countries and 5 non-EU countries) and is composed by four interconnected pillars: A - Blue growth; B - Connecting the region; C -Environmental Quality; D - Sustainable Tourism. The Strategy aims at developing the economies of the Adriatic countries through a sustainable model with the purpose of overcoming the disparities between the countries involved.

An updated picture of current funding opportunities for coastal erosion mitigation interventions has been outlined to support municipalities and operators in raising funds and accessing the EIB/EIF/EASME programme.

For the implementation of instruments within the blue economy, Regional and local authorities can make use of several financial instruments, in particular, the European Structural and Investment Funds (EIF funds), i.e. EMFF, ERDF, ESF and EAFRD. These Funds are intended to create jobs and promote a healthy and sustainable economy and environment.





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1. OVERVIEW OF TRITON PROJECT

The Apulian and Western Greece coastlines are facing significant erosion impacts due to natural causes (extended fetches, stormy winds, high waves and strong currents) and man-induced causes (such as urban expansion, touristic development and single-purpose coastal and/or watershed infrastructures).

The Triton (Development of management Tools and diRectives for immediate protection of blodiversity in coasTal areas affected by sea erOsion and establishment of appropriate eNvironmental control systems) project, funded by the EU Cooperation Programme Interreg V-A Greece-Italy (EL-IT) 2014-2020 and stated on 16/04/2018, has the following objectives:



IMPROVE KNOWLEDGE

of public administrations and stakeholders involved in coastal management;



CREATE A NETWORK

and research centers;

administrations, technicians

between public



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IMPROVE COOPERATION

on territorial planning tools between public authorities and experts from Western Greece and Apulia;

IDENTIFY COMMON METHODOLOGIES

between Apulia and Western Greece for monitoring and mapping risk indicators to be included in planning and investment policies for the medium and long term.

The main results of the project are:

Enhanced awareness

involvement in coastline and management and coastal erosion issues for public and private entities and citizens, through the project public events, workshops, videoclips and social media;

Networking and improved dialogue between the authorities and experts of Greece and Italy during the project's cycle and beyond, thus enabling better adjustment of the legal and spatial planning instruments, through a crossborder event and an Italian-Greek summer school;



Capacity building and training

of public administration staff as well as of stakeholders involved in coastal management, mainly through two cycles of traning days;

A long-term contribution

to a better protection of the coastline from erosion thought education, new tools and best practices sharing, pilot projects analysis, the web platform and studies.

2. TECHNICAL AND GEOLOGICAL **ASPECTS OF COASTAL EROSION: IMPACT** ANALYSIS ON BIODIVERSITY AND HUMAN POPULATION

Erosion affects more than 70% of the coasts worldwide and is caused by human activities and natural environment changes, making the coastal sediment dynamics lose balance and lead to coastline retreat and beach erosion. Coastal land is being swallowed by the seawater and coastal villages and houses are forced to move inland: so humans living spaces are squeezed, the beach biodiversity and ecological balance are been destroyed, and there are direct or indirect harms on human life and natural environment. Nowadays, coastal erosion has changed from a natural environmental change to a serious hazard.

2.1. NATURAL CAUSES OF EROSION

Erosion, in principle, is the detachment and transportation of the weathered rock materials away from a coast. There are four types of erosion that take place at coastal regions: (a) abrasion - the force of sand and pebbles being thrown by the sea scraping away at rock, (b) attrition - the wearing away of rocks in the sea by hitting off one another, (c) hydraulic action - the wearing away of rocks by the force of the water, this can also occur through the compression of air in small gaps by water, (d) solution - the chemical breakdown of rock by seawater. Rocks can also be broken down by physical and chemical weathering processes.

Natural shoreline changes induced by erosion and accretion take place over a range of time scales. They may occur in response to short-term events, such as storms, regular wave action, tides and winds, or in response to long-term

events such as glaciation or orogenic cycles that may greatly alter sea levels and tectonic activities that cause coastal land subsidence or emergence. Most coastlines are naturally dynamic, and cycles of erosion are often an important feature of their ecological character. Excluding the impact of human activity, these processes are simply natural evolutionary phenomena. The occurrence of coastal erosion is dependent upon the balance between the resistance, or erodibility, of the coastline and the strength, or **erosivity**, of the waves and tides affecting the area. These conditions are, in turn, reliant upon a number of factors, including: topography, the composition and structure of the exposed geological formations, local currents and tidal range, wave climate (wave height, period, direction and fetch), groundwater, sediment supply (provided by eroding cliffs and rivers' load), and relative sea

level changes or even from coastal or underwater landsliding. Consequently, rates of coastal erosion and accretion are very variable at regional, national and international scales.

All the above natural factors controlling the coastal sediment budget are well included in the theoretical backbone of the "littoral cell". A littoral cell is a coastal part that contains a complete cycle of sedimentation including sources, transport paths, and sinks. The cell boundaries define the geographical area within which the budget of sediment is balanced, providing the framework for the quantitative analysis of coastal erosion and accretion. The sediment sources are commonly river streams, sea cliff erosion, onshore migration of sand banks, and material of biological origin such as shells, coral fragments,

2.2. ANTHROPOGENIC EROSION

Human activities along the coast (land reclamation, port development, shrimp farming), within river catchments and watersheds (river damming and diversion) and offshore (dredging, sand mining) in combination with the natural forces included in a littoral cell often intensify coastal erosion locally and jeopardize opportunities for coasts to satisfy their socio-economic and ecological roles at a reasonable societal cost. Moreover, technical coastal defences are designed to protect areas of increased local economic interest, usually taking into consideration only the average prevailing environmental conditions and up to a limited static viability, restricted by the



and skeletons of small marine organisms. The usual transport pathway is along the coast by waves and currents (longshore transport, longshore drift). However, cross-shore (on/offshore) paths may also be strong and include windblown sand, sand transferred due to wave swash on the beach or rip and tidal currents to offshore sand bars and sheets or even due to ice-push. Most sediment deposits (e.g. deltas, sand bars, splits and dunes) tend to migrate in a natural way over the year(s) according to the sediment budget and weather conditions. Those are important sediment banks ready to be reworked and be engaged in the littoral cell. The sediment sinks are usually offshore losses at submarine canyons and shoals or onshore dune migration, rollover, and deposition in bays and estuaries.

current technical capabilities. Factors such as the occurrence of storm events, changes to the state of engineered coastal defences, changing land use and sea level rise may alter the balance between resistance of the coastline and the strength of the eroding forces, triggering coastal erosion even more severely.



77 The main anthropogenic interventions causing coastal erosion are the following one.

1. DAMS

Thousands of dams have been constructed on rivers worldwide, creating reservoirs which retain a large part of the sediment discharge from the catchment areas. The best-known example of coastal erosion related to sediment trapping behind a river dam is the erosion of the Nile Delta coast after the construction of the Low and High Aswan Dams in the 1960's and 1970's. The coastal erosion reached a level of 42 m/year during the period 1969-1971, mainly because of the reduction in the river discharge and the construction of the Low Aswan Dam, whereas a drastically increased erosion rate of 129 m/year after 1971 was caused by the construction of the High Aswan Dam.

2. SAND MINING IN RIVERS AND BEACHES

Sand mining in rivers is a major cause of coastal erosion in many Countries. Sand mining in a river lowers the riverbed, causes bank erosion and reduces the supply of sand to the coast. Beach sand mining directly reduces sand volume.

3. AGRICULTURAL DRAINAGE SYSTEMS

They cause redistribution of sediments in the longshore making the littoral cell adapt to the new sediment budget status.

4. CONSTRUCTIONS CLOSE TO THE COAST

Coastal constructions on beaches may destroy sand dunes or lose their stability. Sand-dunes are a natural defense of beaches against erosion; buildings on the beach, on the other hand, act as seawalls making waves erode their foot until they collapse.

5. HARD CONSTRUCTIONS FOR COASTAL PROTECTION

Hard constructions, like ports, groynes, detached breakwater, seawalls/ roads and revetments cause landform migration interruption. Changing the sediment fluxes to the sea, stabilizing sand formations or altering the sediment transport pathways through hard constructions leads to local changes in the sediment budget and forces the ecosystem to adapt, usually not in favor to man.

6. DREDGING IN ACCESS CHANNELS AND PORT ENTRANCES

This technical operation also reduces sand volume in the coast changing the local sediment budget causing erosion in nearby areas.

7. SEA LEVEL RISE DUE TO CLIMATE CHANGE

Climate change is widely considered as a response of nature to anthropogenic interventions and it leads to sea level rise and to changes in annual rain frequencies as well as in river supplies. The above changes directly disturb sediment diet at the coasts and may lead to extensive erosion of the most affected areas.

8. LOSS/DEGRADATION OF AQUATIC AND COASTAL HABITATS

Anthropogenic changes in ocean oxidation, water temperature, and nutrients changes, as well as mechanical abrasion leads worldwide to degradation, or even loss of aquatic habitats. Aquatic habitats, especially seagrasses (e.g. Posidonia oceanica in Mediterranean) act as natural submerged breakwaters, minimizing the wave energy reaching to the beach. Moreover, their dead leaves and roots are stranding on the beach, offering an extra mechanical protection against erosion. In the same way, coastal habitats, such as the sand-dune vegetation, stabilize coastal sediments and are considered a very effective self-protection of beaches.

2.3. CONSEQUENCES OF COASTAL EROSION

Coastal erosion typically results in a landward retreat of the coastline. This can increase the risk of coastal flooding and result in loss of land and damage to buildings, infrastructure and agricultural land. Sudden coastal erosion events, particularly those in the vicinity of coastal cliffs, may directly endanger the lives of people. The movement of salt-water into freshwater areas (saline intrusion) can occur during coastal flooding and can impact upon the biodiversity of previously freshwater or terrestrial ecosystems. Coastal erosion may cause damage to buildings, infrastructure and utilities and any resulting debris may enter the coastal system, potentially endangering humans and coastal ecosystems. Disruption to gas utilities may also provide a fire hazard, disruption to water pipes, a flooding hazard and disruption of the sewerage network a health hazard.

Moreover, beaches and coastal wetlands are normally in equilibrium with the dynamic longshore sediment transport alongside the provision of ecosystem goods and services. Wetlands are in most cases utilized for agriculture, water abstraction and livestock rearing with the associated changes in land use linked to clearing of vegetation cover and conversion of land to its current use. This has led to an influx in sediments from the catchment into the rivers, and this suspended sediment loading increases turbidity and siltation. During heavy rains, coastal and river flooding occurs with notable impact on the coastal ecosystems: coral reefs and seagrasses are destructed, or their growth is retarded due to sediment retention. These ecosystems are natural stabilizers keeping the coast in equilibrium with the dynamic waves and tides that dominate the coastal waters. Frequent flooding of rivers and coastal wetlands degrade coastal marine ecosystem by the increase in sediment loading in the recent past.



Figure 1: Examples of hazards regarding coastal erosion. Top: Loss of buildings, infrastructure facilities, middle: decrease of sand volume to compensate the natural littoral processes in the Nile delta and bottom: Degradation or loss of coral reefs due to deposition of silt and increased water turbidity. Source: The Web



99 The impacts of erosion can be summarized in the following way:

- loss of habitat/ beach and landscape quality; degradation or loss of coral reefs due to deposition of silt and increased water turbidity;
- (2) loss of buildings, infrastructure facilities, such as roads and power lines;
- (3) increased sea water turbidity and decreased water quality;
- (4) reduction of the tolerance of the coastal environment to face natural hazards such as severe wave surges and Tsunamis or cause flooding in the lowland areas;
- decrease of sand volume to compensate the natural littoral processes;
- (6) reduction of the scenic beauty of the beach;
- (7) collapse of the tourism in the affected area;
- (8) loss of boat anchorage sites;
- (9) increased wave energy on beaches endangering swimmers and passers-by;
- (1) reduction of primary production and fish productivity;
- considerable annual expenditure for damage mitigation, control and disaster relief.

2.4. HARD AND SOFT COASTAL PROTECTION ENGINEERING

Coastal erosion problems have led to major efforts to manage them and to restore coastal capacity to accommodate short-and long-term changes induced by human activities, extreme events and sea level rise. The erosion problem becomes worse whenever the countermeasures (i.e. hard or soft structural options) are inappropriate, improperly designed, built, or maintained and if their effects on adjacent shores are not carefully evaluated. Most times erosion is addressed locally or at regional boundaries, instead of at littoral cell's real boundaries that reflect natural processes. This anomaly is mostly attributable to insufficient knowledge of coastal processes and the protective function of coastal systems.

Hard structures for coastal protection have very high economic and social costs;

there are strong negative public reactions to rock emplacements along the coast. This has led to uncertainty among managers and local government authorities on how to treat shoreline erosion. It has become an issue for serious debate for politicians, coastal managers, land and property owners, lawyers, bankers, insurers and fisherfolk, especially in areas of intensive use and rapidly rising coastal land value.

Many of these stakeholders are resorting to planned retreat where houses or hotels are simply removed and the coast is left to erode. Beach nourishment – reshaping can be an expensive solution, unnecessary and sometimes impossible, especially in highly modified environments, however it is often applied in the recent days as the only viable solution.

Increased interest in soft structures

for coastal protection and a combination of hard and soft structures is dominating nowadays and is in harmony with advanced knowledge on coastal processes and natural protective functions. There is evidence that coastal vegetation and forests provide some coastal protection and that the clearing of coastal forests and trees has increased the vulnerability of coasts to erosion. Some of the most effective soft coastal engineering measures that have proved to be really powerful are sand dune management and stabilization, artificial reefs to behave as detached breakwaters, geotubes for beach stabilization or for making shallow submerged breakwaters and finally bypassing, a regulation to maintain sediment budget close to ports and river mouths, unfortunately rarely honored.



2.5. WHAT IS REALLY THE STATE OF THE WORLD'S BEACHES

For many years, the accepted idea was that 70% of our beaches were eroding. There is a recent research showing that the sandy coastline does not actually erode that dramatically¹). Indeed, there are more beaches that grow than beaches that shrink. The main reason is that we are able to maintain our coasts well (as in the Netherlands) or even to expand them (as in Dubai and Singapore). A source of sand (sometimes forgotten) is the discharges from the mining industry. It has now been quite convincingly proven that 24% of the world's sandy beaches are eroding at rates exceeding 0.5 m/yr, while 28% are accreting and 48% are stable.

Figure 2: Examples of soft coastal engineereing practices. From top left to lower left: artificial reefs, dune management using temporary constructions, dune stabilization through planting and geotubes as submerged breakwaters. Source: The Web

¹ https://aqua-monitor.appspot.com/?datasets=shoreline



But, should we be happy about those findings? Let's see some facts.

- (\Rightarrow) The fastest rate of beach growth, no less than eight metres per year, was seen in Namibia. It is caused by a mining company that has built sand hills in the sea for diamond mining.
- The Netherlands is also in the top ten of beach growth areas due to effective beach nourishment policies and the construction of the Sand Motor².
- → Four of the seven largest eroding beaches are in the United States. Beaches in Louisiana and Texas are being hit particularly hard, sometimes receding by 15 metres a year. The Mississippi is the culprit in Louisiana where the sand supply has fallen sharply due to the damming of the river. One of the causes in Texas is groundwater extraction in response to the rapid growth of Houston.

As seen on those examples, both erosion and accretion patterns worldwide seem to be anthropogenic in their origin. Man has taken control of the coastal processes causing extensive adaptations to the natural sediment balances, something whose impact on human life is still too early to be assessed.



Figure 3: Erosion and accretion of word sandy beaches during the last 30 years. You can find more details in: http://agua-monitor.appspot.com/?datasets=shoreline. Source: aua-monitor.appspot.com

2.6. SCENARIOS AND CHALLENGES FOR THE FUTURE

Predictions of future rises in sea level and storminess may result in increased coastal erosion rates in locations throughout the globe. Changes to storm tracks and tidal currents could also lead to alteration in the movement of coastal sediments, potentially creating new risks from coastal erosion. Coastal lowland areas and those with softer, less resistant geology will be among those most affected. The current trend towards the replacement of 'hard' coastal defences to softer strategies such as beach nourishment and managed realignment may in selected cases result in temporary increases in coastal erosion.

The risk of coastal flooding and erosion overseas, will increase as existing man-made defences (e.g. flood embankments and seawalls) deteriorate as a result of sea level rise due to climate change. Land close to the sea is often under pressure, both from development and as a natural resource (e.g. to provide minerals and renewable energy). There are, however, constraints on public spending and a growing awareness of the need to preserve the natural coastal environment and to ensure that its management is sustainable.

It is important to understand the physical processes that have so far shaped and will continue to affect the coastline before planning any engineering or management works. These processes include wave generation and propagation, the movements of the tides and the resulting disturbance and transport of sediments both over the seabed and on beaches. Predicting how the coastline will continue to change, with or without human intervention, is a fundamental requirement for planning. Coastal management requires the application of extensive, well designed and scientifically valid monitoring practices. Even though we can control erosion overall with good coastal management, problems have been identified at the regional and local levels. Local factors can also be related to construction of ports or other infrastructures, which can sometimes negatively affect the natural coastal dynamics. Sand is not always available locally to protect the coast.

The main questions for the future are:

- () How will coastal ecosystems react to artificial coastal environments? How long will it take for them to adapt?

² https://www.deltares.nl/en/projects/sand-engine

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3. INTEGRATED WEB GIS COASTAL PLANNING

A new webGIS observatory platform was designed, developed and implemented within the framework of TRITON Project, covering the coastal zone of the Municipality of Ieras Poleos Messolonghiou and the southern part of the gulf of Patras, Western Greece. The tool is tailored for decision-making, risk assessment and emergency preparation and response in coastal areas. The webGIS system collects environmental, meteorological, oceanographic, hydrographic, hydrological dynamic spatio-temporally-varying data, combined with static data on land-use, geology, topography, erosion/accretion rates, seagrass abundance, etc. All datasets were retrieved from external platforms and data providers like NOAA, Copernicus Marine Environmental Service, Corine, etc. The system is capable of processing and visualizing these data in real-time mode.

The tool is designed to combine sophisticated forecast modelling systems from multi-scale analysis of water bodies (rivers, open and coastal sea), including waves, hydrodynamics and wave energy prediction, with real-time monitoring networks for forcing and continuous validation purposes. Tailor-made visualization and analysis products, conceptualized for multiple uses through a serviceoriented framework, provide an easy and interactive access to both data and operational forecasts. Thus, the TRITON's webGIS is a space for interactive visualization of the spatial data collected in the project and organized in a common spatial infrastructure in Greek and will be available to the public through the Municipality of leras Poleos Messolonghiou official website.

3.1 USE OF SOFTWARE FOR INTEGRATED WEB GIS COASTAL PLANNING

Web mapping plays a significant role in geoportals of Spatial Data Infrastructures (SDI) allowing the visualization of spatial data from several sources. Web mapping clients are pieces of software (applications, viewers, libraries and frameworks, among others) that either provide or extend a web-based mapping component to view and interact with maps from remote sources on the Internet. In order to publish spatial data in a web map, Application Programming Interfaces (APIs) frameworks are often used as the intermediate to translate low level code to objects on map. In fact, APIs are a set of building blocks that you invoke using a programming language. Currently, one of the most popular open-source web mapping APIs is Leaflet.js, that is designed to be lightweight (only 38kb of code at the time of this writing), mobile-friendly, and easy to get started with (Farkas, 2017a, 2017b; Muehlenhaus, 2013; Peterson, 2014). Leaflet is designed with simplicity, performance and usability. Therefore, simplicity and the open source characteristics of Leaflet is the reason that it was selected as the main mapping library of TRITON's web GIS page. The aim of this TRITON webGIS development was to create an open source JavaScript API for users interested in building interactive and multimedia web mapping applications for common desktop and mobile browsers.

Therefore, TRITON webGIS is based in the Leaflet.js library as described above and combines Geographic Information Science (GIS) principles and tools to harmonize the relatively large and multi-dimensional datasets, including several themes like elevation, land uses, shoreline evolution, hydrography, weather, monitoring and oceanography. The tool was created using cutting edge technologies and combines intelligent web maps together with charts and text to unlock, make accessible and re-usable geospatial data to the broad public in a coordinated manner. More specifically, the tool is trying to find a way for the local and regional authorities to achieve transparent coastal zone management governance and collaboration of all stakeholders and provide data and information to citizens and scientists.



Figure 4: TRITON's webGIS system architecture. Source: Triton project elaboration

TRITON's webGIS system architecture is based on three parts that cooperate in harmony. Starting from the last part (Client side), user is interacting with a web mapping application that is created with Leaflet.js library and sends queries of screen visualization to a server. This server is established at the Laboratory of Ecological Engineering and Technology,



Department of Environmental Engineering, Democritus University of Thrace and consists of two different Servers: a Web Server that hosts the TRITON's website and handles Python Server scripts and a Map server that pushes the user's queries to external Data Servers.

3.2 USE OF EARTH OBSERVATION DATA BY LOCAL AUTHORITIES FOR A BETTER COASTAL MANAGEMENT

The coastal zone is a very dynamic geomorphologic system where changes occur at diverse temporal and spatial scales (Mills, Buckley, Mitchell, Clarke, & Edwards, 2005), mostly related to erosion, as a result of natural and/or anthropogenic activities (Van Rijn, 1993). Natural effects include shoreline interactions with incident waves, tides, storms, tectonic and physical processes and the sediment load transported from the watershed by rivers (Dolan, Yui, & Geist, 1981). Coastal zone monitoring is an important task for national/regional development and environmental protection, in which the assessment of the state of historic shorelines is important (Rasuly, Naghdifar, & Rasoli, 2010). Coastal authorities are faced with the increasingly complex task of balancing development and managing coastal risks. Integrated Coastal Zone Management (ICZM) provides a framework to solve conflicts, mitigate impacts of short-/long-term uses and support strategies for sustainable coastal management (Anfuso, Pranzini, & Vitale, 2011).



Figure 5: Shoreline movement data as displayed on TRITON's webGIS page. Source: TRITON's webGIS page

TRITON project developed a series of algorithms to easily download and access existing meteorological (wind speeds and direction) and oceanographic data (currents and waves hindcasted and forecasted) from external platforms and systems. In parallel, a series of algorithms was developed to process the data retrieved, e.g., extensive waves analysis, circular wave statistics, ray wave models to nearshore, calculation of wave-induced nearshore current, wave breaker zone characteristics, waveinduced theoretical sediment transport, etc. The method could eventually be applied at any area of interest of the program study site. In addition, dynamics of shoreline movement was studied by examining and assessing the coastline erosion and accretion "hotspots", using high resolution historical satellite images (Zachopoulos, Kokkos, Zoidou, & Sylaios, 2019). The TRITON webGIS system collects environmental, meteorological, oceanographic, hydrographic, hydrological dynamic spatio-temporally-varying data, combined with static data on land-use, geology, topography, erosion/accretion rates, seagrass abundance, etc. All datasets were retrieved from external platforms and data providers like NOAA, Copernicus Marine Environmental Service, Corine, etc. The system is capable of processing and visualizing these data in real-time mode.

More precisely, meteorological data (such as wind speed, wind direction and precipitation) were retrieved from the Global Forecasting System (GFS) and tranformed into a timeseries of vector tiles while timeseries of meteorological data from the local station were retrieved from the University of Patras. Oceanographic data (such as currents, waves and water temperature) were retrieved from the Copernicus Marine Environmental Monitoring Service (CMEMS) database and transformed into a timeseries of vector tiles while timeseries of wave and sea surface height data retrieved from the University of Patras. Hydrologic data for each of the rivers were retrieved with AJAX requests from the Swedish Meteorological and Hydrological Institute (SMHI) and transformed to an easily accesible graph with the ability to download original data. Bathymetry and Topography data retrieved from the European Marine Observation and Data Network (EMODnet) and the Shuttle Radar Topography Mission (SRTM30), respectively, in WMS tiles covering the entire area. Land cover data retieved from CORINE database and transformed into interactive vector tiles. Moreover, land cover data retrieved from Hellenic National Cadastral in WMS tiles. Seagrass coverage data retrieved from EMODnet in WFS and WCS tiles. In the table below, a description of these data can be found. Shoreline data for the Municipality of leras Poleos Messolonghiou were created as mentioned above from the Democritus University of Thrace while data for the Southern part of the gulf of Patras were created from the University of Patras.

ΑΤΑ	ТҮРЕ	RESOLUTION	PROVIDER
Bathymetry	Raster (WMS Tiles)	1/16 × 1/16 arc min	EMODnet
Topography	Raster (WMS Tiles)	1 arc-sec	SRTM30
Shoreline Change	Vector (Shapefiles)		DUTH,
Land Cover	Vector (Shapefiles),		Corine,
	Raster (WMS Tiles)		Hellenic National Cadastral
Seagrass	Vector (WFS Tiles),		EMODnet
	Raster (WMS Tiles)		
Hydrologic data	Timeseries	Daily	SMHI
Oceanographic data	Vector (netCDF),	0.042 × 0.042	CMEMS
	Raster (WMS Tiles)	degrees	
Weather data	Vector (Geojson),	0.25 × 0.25	GF
	Raster (WMS Tiles)	degrees	

Table 2: Description of the data collected in the TRITON webGIS system



These Earth Observation Data were eventually organised

into well-structured layers imported in the TRITON webGIS environment, aiming to:

- A aid decision-makers at Municipal, Regional and National level to formulate policies on ICZM matters:
- B provide reliable datasets to scientists and engineers;
- c) engage active citizens and the broader public into coastal zone issues;
- D promote the distribution of information among coastal managers, stakeholders and the general public.



Figure 6: Corine 2018 land cover of the Municipality leras Poleos Messolonghiou and the southern part of the gulf of Patras as displayed on TRITON's webGIS page. Source: TRITON's webGIS page



Figure 7: Shoreline change in a specific area of the Municipality Ieras Poleos Messolonghiou as displayed on TRITON's webGIS page

Source: TRITON's webGIS page

BAYESIAN NETWORK APPROACHES FOR ICZM 3.3 AND ADAPTATION PLANNING

It is widely recognized among the scientific community that climate change is leading to severe impacts on terrestrial and marine ecosystems worldwide in a variety of ways (IPCC, 2018). Climate-related impacts will be especially severe across coastal areas, where a dense interaction between terrestrial and marine systems occurs (IPCC, 2018). In this already complicated scenario, coastal areas are also experiencing relevant pressures resulting from several anthropogenic pressures linked with coastal economic development (e.g. touristic activities and infrastructures along the shoreline) and the connected land use changes (e.g. urbanization) (Ramieri et al., 2011). An integrated approach to coastal management is needed to face coastal erosion processes, merging both technical and scientific studies to identify, on one side, the main causes contributing to coastal imbalance and to design, on the other, the most appropriate monitoring actions for understanding the trends and the required structural measures, following the order of priority resulting from the level of risk.

GIS-BN METHODOLOGICAL APPROACH 3.4

Bayesian Networks (also known as Bayesian belief networks) are probabilistic graphical models, widely used for knowledge representation and reasoning under uncertainty within natural resource management (Pollino & Henderson, 2010). They are based on the Bayes' theorem of probability to propagate information between nodes, which state that the likelihood of an event, based on prior knowledge of conditions, might be related to the event, as expressed in the following equation (Bayes, 1763):

Drawing on this need, different tools and methods have been developed so far by the research community in order to provide support to policy and decision makersintheimplementationofEuropean recommendations and directives for integrated coastal zone management (ICZM; UNEP, 2008; EC, 2013). Among these, Bayesian Network approaches have been recently applied (Giardino et al., 2019; Gutierrez et al., 2011; Poelhekke et al., 2016) to explore, through scenario analysis, the effects induced by different management and policy setting, as well as climate conditions, with the final aim of supporting the development and implementation of coastal management measures robust enough against uncertainties and changes over time.

Building on these approaches, a GIS-based Bayesian Network (GIS-BN) approach has been designed and implemented within the TRITON pilot case of the Ugento shoreline (Apulia Region-Italy), evaluating coastal erosion risks in terms of physical shoreline evolution and water quality (WQ) changes (e.g. changes in water turbity) against two different 'what-if' scenarios, including changing climate conditions.

 $P(A|B) = \frac{P(B|A)P(A)}{P(B)}$



Where:

- → P(A) and P(B) are the probabilities of observing A and B without regard to each other;
- (\rightarrow) P(A|B) is the probability of observing the event A given that B is true;
- \bigcirc P(B|A) is the probability of observing the event B given that A is true.

Being a probabilistic graphical model, BNs include:

- i) a qualitative part, the structure of the network in terms of a Directed Acyclic Graph (DAG), which is composed by nodes representing the set of selected variables and arcs between nodes indicating directed probabilistic dependencies between the corresponding variables;
- ii) a quantitative part, the parameters of the network encoding the conditional and marginal probabilities of the system's variables (Pearl, 2011).

Within environmental asessment ad management, BNs approaches are widely used since facilitating the rapid conceptualization of the system to be managed and the evaluation of dependences or interdependences between data and their inherent uncertainty evaluated as belief probabilities. One of their strengths lies on the possibility of considering multiple stressors and assement endpoints in the same framework, thus supporting modelling and analysis of complex environments like coastal systems. Moreover, different knowledge domains, expertise and data sources can be integrated into the same BN model, acting as a decision support tool able to inform coastal risk assessment and management.

The development of a BN model, as that designed for the Ugento pilot case, requires the implementation of specific operative phases as summarized in the figure.



In order to operationalize the BN model for the Ugento pilot case, a variety of physical, environmental and oceanographic data (e.g. currents, waves, winds, water suspended particulate matter) were retrieved from the Copernicus Marine Environment Monitoring Service (CMEMS; https://marine.copernicus.eu), allowing to spatially characterize the main marine stressors contributing to coastal erosion processes (e.g. significant waves, sea level rise) and the connected effects in terms of WQ changes (e.g. higher water turbidity) and physical shoreline evolution. Moroever, as far as information on the shoreline evolution trend is concerned (in term of meters of advancing or retreating coasts), RapidEye satellite images available for the investigated case (www.planet.com/ explorer) were used by applying remote sensing techniques for time-based coastline identification and extraction against the 2009-2018 timeframe. This data, together with information on management and adaptation strategies put in place by the Municipality of Ugento in the last ten years to cope with local erosion phenomena (e.g. implementation of nature-based soutions -NBS- for dune restoration, submerged breakwaters), were used for the training, calibration and validation of the designed BN model.



Figure 9: BN model designed for the Ugento shoreline pilot case (WAH: Significant wave height; WAD: Wave direction from; WAP: Sea surface wave mean period; MWAH: Max significant wave height; WIH: Significant wind wave height; IWE: Incident wave energy at the breaker zone; WIP: Sea surface wind wave mean period; ESV: Eastward sea water velocity; NSV: Northward sea water velocity; SLR: Sea-level rise; WID: Wind wave direction from; MIWE: Max incident wave energy at the breaker zone; MWIH: Max significant wind wave height; NBS: Nature-based solutions; IFS: Infrastructures; SPM: Suspended particulate matter; KD: Diffuse attenuation; SEV: Shoreline evolution). Source: Triton's partnership elaboration

Once the BN model has been validated, it can be easily applied for scenarios analysis, inferring the behaviors and responses of the variables considered in the network against multiple 'what-if' scenarios. Within the pilot case of the Ugento shoreline, potential changes in

climate conditions and management measures were envisioned using the BN model for BN for diagnostic analysis, evaluating the probability of shoreline evolution (SEV) and WQ variation (i.e. suspended particulate matter - SPM, diffuse attenuation for - KD) against two



simulated scenarios. Specifically, under the 'A rapid changing world' scenario, the effects of a potential increase in extreme storm surge events (as evidenced in the last decade; Lionello et al., 2016) was simulated. Then, within the 'Green is the new black' scenario the implementation

of new natural based measures to face coastal erosion risks along the Ugento shoreline was assumeed, estimating changes in the BN assessment endpoints and solutions required to face local erosion processes.

A rapid changing world



Green is the new black

Figure 10: 'What-if' scenarios envisioned for the TRITON pilot case of the Ugento shoreline. Source: Triton's partnership elaboration

RESULTS FROM THE UGENTO PILOT CASE 3.5

Resulting output from the BN-based scenario analysis, revealed, even if in a minor extent, a nexus between changes in the oceanographic boundary conditions and the shoreline evolution and WQ parameters (i.e. suspended matter, diffuse attenuation), with increasing probability of erosion/accretion and higher turbidity along the coast against a simulated rising significant wave height ('A rapid changing world' scenario). However, these adverse conditions could be faced by improving local-scale naturebased solution plan, since results from the 'Green is the new black' scenario highlighted the stability of extreme erosion and accretion classes (and consequently the increase of moderate ones) under the implementation of new management measures located along the coast.

More specifically, by focusing on the first scenario 'A rapid changing world', a significant change can be observed in the stable class (i.e. in the range [-1, 1) meters) of the shoreline evolution parameter, with an important reduction of stable coast (about 10%). Interestingly, this change was converted into the classes related to the most unstable coast, i.e. an increase of about 6% for both the coast in 'high erosion' (in the range [-inf, -10) meters) and 'high accretion' states (in the range [12, inf] meters). This phenomenon can be explained by the balance of sediment mass transport along the coast. Specifically, the increase of extreme events could lead to higher wave height and wave energy that would trigger in turn higher erosion rates and, consequently, higher erosion mass in some sections of the coast (e.g. in the Torre Mozza area). As a consequence, this mass is transferred by the current and seawater along the shoreline, replacing sediments

in other areas where a higher accretion rate was observed (e.g. Fontanelle). Regarding the WQ nodes, a similar trend can be observed for both Suspended Matter (SPM) and Diffuse Attenuation (KD) variables, i.e. an increase of about 2% probability of their upper classes (in the range [8, inf] gm-3 and [0.13, inf] m-1, respectively) and a decrease of about 2% within lower boundary classes (in the



Figure 11: Results of the diagnostic inference from the two scenarios and the assessment endpoints considered within the Ugento pilot case (i.e: Scenario 1: A rapid changing world; Scenario 2: Green is the new black; SEV: shoreline evolution trend; SPM: suspended particulate matter; KD: diffuse attenuation). Source: Triton's partnership elabor

By focusing on the 'Green is the new black' scenario, a significant negative change can be observed in the stable class (in the range [-1,1) meters) of the SEV node. Nevertheless, this change is converted into the two moderate classes (i.e. erosion and accretion) instead of the high erosion or high accretion ones. Interestingly, these most unstable classes don't show significant changes under this scenario (i.e. less than 1% for both states (in the range [-inf,10) and [12,inf] meters, respectively). This result confirms as NBS can produce significant positive effects in the stabilization of the Ugento shoreline,

range [-inf,2) gm-3 and [-inf,0.05] m-1, respectively). Noticeably, the magnitude of changes for the WQ parameters was less significant than those observed for the SEV. This behavior confirmed that changes in the oceanographic boundary conditions would lead to more severe impacts on the shoreline evolution rather than to the WQ.

thus reducing the probability of resulting in high erosion or high accretion coastal sections. As far as WQ variables are concerned, a minor reduction can be observed in the lower boundary class (in the range [-inf,2) gm-3 and [-inf,0.05] m-1) of both SPM and KD, with no any significant trends in the other classes. These trends show as NBSs would not significantly influence WQ variables, since they are mainly driven by more complex biological, oceanic processes, rather than physical dynamics driving more relevant changes in the shorelines.



3.6 NUMERICAL MODELLING AND ITS APPLICATION IN THE GULF OF PATRAS

Numerical modelling concerns the study of wave propagation, wave-generated currents and sediment transport along the coastal zone. The pilot area for its application was the gulf of Patras, in the region of Western Greece. The modelling was carried out by performing coupled numerical simulations of wave propagation, wave-generated currents, sediment transport and bed morphodynamic evolution in the coastal zone of the pilot area, using the numerical model MIKE 21 (2014) developed by the Danish Hydraulic Institute (DHI). The specific numerical model can simulate wind-induced wave generation, growth, and propagation. The input data for the MIKE 21 numerical model are the bathymetry of the Patras Gulf, the bathymetry of the Ionion Sea between the Gulf of Patras and the islands of Kefallonia and Zakynthos, the geometry of existing harbor works in the area, the sediment composition in the coastal zone, as well as the significant wave height and wave period of the offshore incoming waves. All data were collected in the frame of the TRITON project and have been used for this type of modelling.

For clarity of the presentation of the results and better understanding of the coastal processes, the pilot area was divided into 8 coastal independent subregions.



Figure 12: . Satellite image of the pilot area of the Gulf of Patras showing the 8 coastal independent subregions. Source: Triton's partnershin ela

With the application of the aforementioned numerical modelling it became evident the characterization of the erosion intensity in the 8 subregions of the pilot area of the Gulf of Patras, for

each wind direction, according to the numerical results. It proved that windgenerated northeastern waves have a strong impact on coastal erosion in the pilot area. Strong wave-generated

currents are created as well as sediment transport along the coastline, which is generally directed from east to west, but locally it is reversed creating more intense erosion conditions. This impact applies to the entire coastal zone of the pilot area, except for the eastern part of the area, and specifically from Anemomylos to the Glafkos river estuary. Wind-generated northwestern waves have also a significant impact on coastal erosion of the pilot area. Quite interesting is the creation of cross-shore sediment transport conditions towards the deep waters through rip currents in the eastern part of the area, and

	SUBREGION	NE	NW	w	sw
1	Papas Lagoon – Karnari	High	Low	Zero	Zero
2	Karnari – Ioniki Akti	High	Low	Zero	Zero
3	Ioniki Akti – Alykes	Moderate	Low	Zero	Zero
4	Alykes – Gialos (Peiros estuary)	High	Low	Zero	Zero
5	Gialos – Western Kaminia	Moderate	Moderate	Low	Zero
6	Western Kaminia – Western Vrachneika	Moderate	High	Moderate	Zero
7	Western Vrachneika – Roitika	Low	High	High	Low
8	Roitika – Glafkos	Zero	High	High	Low

Table 3: Characterization of the erosion intensity in the 8 subregions of the pilot area of the Gulf of Patras, for each wind direction, according to the numerical results

specifically from Anemomylos to the Glafkos river estuary. The effect of windgenerated western and southwestern waves is generally weak throughout the coastal zone of the pilot area. Erosion conditions occur only in the eastern part of the area, and specifically from Roitika to the Glafkos river estuary.

Therefore, based on the results of the numerical simulations, the characterization of erosion intensity, as zero, low, moderate or high, in the 8 subregions of the pilot area of the Gulf of Patras, per wind direction, can be summarized in the Table.

4 THE LEGAL FRAMEWORK ON COASTAL EROSION AND INTEGRATED COASTAL ZONE MANAGEMENT

The sustainable management of coastlines, which combines the use of coasts with the protection and conservation of habitats and ecosystems, is a strategic issue for Countries such as Italy and Greece, which are largely wet by the sea and which aim to develop an alternative economy, as the European Strategy on "Blue Growth" urges to do. Coastal planning, then, can and must play a central role in the fight against coastal erosion in order to reduce anthropic pressure and prevent the depletion of coastal habitats, facilitating those forms of natural coastal adaptation that, instead, human activities prevent. The regulatory framework for the protection of the coastal zones, with particular regard to the problems of coastal erosion and sustainable and "integrated" development, appears to be composite.

An analysis of the different regulatory levels - international, EU, national (Italy) and regional (Apulia) – will be presented together with a focus on the planning of coastal areas.

4.1 THE COASTAL EROSION

The coastal areas of Italy and Greece are strongly affected by erosion. The phenomenon of coastal erosion is the result of a combination of natural and anthropogenic factors, none of which can be considered the cause of erosion individually. Of course, there is a close correlation between climate change and coastal erosion.

Global warming and acidification of water and, therefore, a cascade of consequences for the environment, depend on CO2 emissions.

Without claiming to be exhaustive, it is evident that global warming causes warming of the waters of the planet, with a consequent increase, also in terms of intensity, of storm surges, which directly impact on coastal areas, contributing to their erosion. Global warming also causes the melting of glaciers and, therefore, contributes to the rise in sea level. This also contributes to coastal erosion.

The rise in sea level and growth of extreme phenomena such as storm surges, also causes saltwater infiltration into coastal freshwater aquifers and damage to the biodiversity of coastal marine wetlands and, consequently, damage to coastal vegetation which is a natural means of protecting the coast from erosion.

Direct human activity in coastal areas can also have a negative impact on Posidonia, dunes or coastal wetlands, which, in turn, are additional natural tools for the protection of coastal areas, contributing to the maintenance of sediment stocks, on land and at sea, to the mitigation of the effects of wave motion or to the absorption of water flows in case of flooding of the coastal area.

The direct anthropic pressure on the coasts include all those works, such as bathing establishments, piers, harbours and brushes at the mouth of rivers, but, unfortunately, often also to all those installed precisely to protect some stretches of the coast: all these works alter the natural coastal dynamics modifying, in fact, the natural evolution. It is clear, therefore, that coastal areas have their own "balance" based on both natural and human factors. It is easy that anthropic factors end up altering the dynamic natural balance of coastal areas, so that they become more exposed to the impact of climate change, also because the natural resilience of habitats

4.2 INTERNATIONAL LEGAL FRAMEWORK

In defining the regulatory framework for the sustainable use of coastal zones, it is necessary to start with the Montego Bay Convention on the Law of the Sea (1982). It aims to achieve the general interest of the international community in protecting and safeguarding the sea and, more generally, biological resources. In the context of the marine environment, there are specific references to the coastal area. This Convention addresses an overall ecosystem approach in coastal zone management, the Ramsar Convention in 1971 had already done, especially in reference to the habitats of water and marsh birds.

The United Nations Conference on the Environment and Development Earth Summit held in Rio de Janeiro in 1992 certainly represents the context in which the concepts of sustainable development and integrated planning for coastal management are interpreted in a modern key.

Indeed, the work of this Conference has given us very interesting documents in the perspective outlined here: in particular, reference is made to the: 1) United Nations Framework Convention on Climate Change of New York (1992), which, in Art. 4, paragraph 1, letter e) recommends the development of appropriate integrated plans for coastal zone management; 2) Convention on Biodiversity (1992) in which the Integrated Marine and Coastal Area Management (IMCAM) work programme was developed, which represents a participatory process for the prevention and control of negative impacts on the coastal areas due to human activity and intends to contribute to the recovery



is reduced.

The coastal ones, therefore, are sensitive areas where "conflicting interests" are concentrated: on the one hand, they are strongly characterized by a biodiversity worthy of protection and conservation, on the other hand, there is a strong human pressure due not only to the concentration of population but also to the presence of activities that, inevitably, generate an impact on the (fragile) surrounding environment.

In the use of the coastline, therefore, sustainable development must be pursued which makes it possible to combine the performance of human activities with respect for marine and coastal habitats.



of coastal areas; 3) Rio Declaration on Environment and Development (1992) which embraces, for the first time, the new global approach to sustainable development as a type of development that responds to current needs without compromising the capabilities of future generations, because it "integrates" and links the environmental factor with the economic and social factor. This document identifies further requirements, such as the need for a global partnership for environmental protection, the requirement for public information and participation in decisionmaking and the requirement for prior assessment of the environmental impact of major national activities affecting the environment.

The concept of sustainable development is, without doubt, the guiding principle of the whole so-called Barcelona system.

It consists of the Barcelona Convention 1976/1995-Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean with its annexed Protocols and subregional agreements. The latter serve to implement the general principles contained in the Convention.

Since its Preamble, the Barcelona Convention contains the concept of sustainable development, so the focus is no longer only on pollution prevention. This principle carries with it the precautionary principle, the call for best available techniques and best environmental practices.

In particular, this principle is best implemented in Protocol VII on Integrated Coastal Management (ICZM. 2008), which also deals with coastal erosion. Because of the importance of its content and its ability to affect coastal planning processes, the Protocol need to be tackled more in detail in the following paragraph.

The Convention has a regional focus as it specifically concerns the Mediterranean region.

This set of rules takes into account, in general, the issue of protection of the sea.

The Convention, together with its seven Protocols, composes a legislative framework of the Mediterranean Action Plan (MAP), one of the different UNEP Programmes on "Regional Seas".

In 2016, the MAP also approved another important legal document "Regional Framework for Climate Change Adaptation for Mediterranean Coastal and Marine Areas". With its approval, the Mediterranean Countries agreed on strategic objectives, indications and priorities for administrators and stakeholders on climate change for marine and coastal areas.

The Convention focuses on the importance of cooperation between States, especially in closed and semienclosed seas such as the Mediterranean Sea: only common policies can effectively safeguard the biodiversity of marine ecosystems.

Then, there is the European Convention on the Landscape of Florence (2000) which, since the Preamble, bears a concept of sustainable development based on a balanced relationship between social needs, economic activity and the environment, must certainly be given due consideration in coastal planning processes. The essence of this Convention to promote preservation (meaning "to conserve and maintain the significant or characteristic features of a landscape, justified by its heritage value derived from its natural configuration and/or from human activity"), management (meaning "action, from a perspective of sustainable development, to ensure the regular upkeep of a landscape, so as to guide and harmonise changes which are brought about by social, economic and environmental processes") and planning of the landscape (meaning "strong forward-looking action to enhance, restore or create landscapes") understood as part of the territory.

According to the Convention, "landscape means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors"

4.3 IN-DEPTH: VII BARCELONA PROTOCOL (ICZM 2008)

The Protocol on Integrated Coastal Zone Management in the Mediterranean (ICZM 2008) was signed in Madrid on 21 January 2008, ratified by the EU on 13 September 2010 by Council Decision 2010/631/EU and entered into force, in Italy, on 24 March 2011.

The ICZM Protocol aims to promote a common framework for the integrated management of the Mediterranean coastal zones.

Integrated Coastal Zone Management is defined as "a dynamic process for the sustainable management and use of coastal zones, taking into account at the same time the fragility of coastal ecosystems and landscapes, the diversity of activities and uses, their interactions, the maritime orientation of certain activities and uses and their impact on both the marine and land parts" (Article 2).

Integrated management, therefore, means the need to relate ("integrate"), on the one hand, the physical-environmental components with the different socioeconomic activities that can take place in the coastal area, on the other hand, both the marine and land components.

As pointed out by some authors (E. Boscolo, La gestione integrata delle zone costiere in Italia: prospettive e prime esperienze, in Rivista quadrimestrale di diritto dell'ambiente, number 1/2011), the coastal areas, therefore, on the basis of this Protocol, "will have to be surrounded by an analytical characterization of the morphotypes and the ecological-landscape continuity, saliently correlated to the relational dynamics between land and sea: there is therefore a spatial extension". The objective of the Protocol is to create a new legal-administrative approach, as the author pointed out, "it is a real paradigm shift, from the logic of collection and exploitation to a model of administrative intervention designed to ensure full sustainability in the use of a fundamental resource". With reference, for istance, to the "exploitation rights grantedon beaches for tourist use: the return of this institution within the framework of the ICZM postulates a profound revision of the institution, in particular of the assignment and maintenance conditions of the exclusive right of exploitation: this is because of the



need to subordinate the tourist exploitation to the assessment of the carrying capacity of the coastal segment concerned".

As stated in Article 5 of this Protocol, the main objectives of integrated coastal zone management are to: "(a) facilitate, through the rational planning of activities, the sustainable development of coastal zones by ensuring that the environment and landscapes are taken into account in harmony with economic, social and cultural development; (b) preserve coastal zones for the benefit of current and future generations; (...) (f) achieve coherence between public and private initiatives and between all decisions by the public authorities, at the national, regional and local levels, which affect the use of the coastal zone".

In this legislative document (Article 6), the key words representing the new approach to coastal zone planning and management issues are: "the ecosystems approach to coastal planning and management shall be applied so as to ensure the sustainable development of coastal zones". The same regulation also provides for further principles, to be considered essential to fill the content and give effect to the principle of sustainable development, such as: "e) various administrative services and regional and local authorities competent in coastal zones will be required (...) (g) the multiplicity and diversity of activities in coastal zones shall be taken into account and priority given, where necessary, to public services and activities requiring, in terms of use and location, the immediate proximity of the sea; (h) the allocation of uses throughout the entire coastal zone should be balanced, and unnecessary concentration and urban sprawl should be avoided".

Environmental impact assessment and strategic environmental assessment can be considered as instruments to achieve the objectives of the Protocol: "The environmental assessments should take into consideration the cumulative impacts on the coastal zones, paying due attention, inter alia, to their carrying capacities" (Article 19).

The Protocol also provides for a transboundary environmental assessment in the case of "plans, programmes and projects that are likely to have a significant adverse effect on the coastal environment". In this case, as provided for in Article 19, the Parties shall "cooperate by means of notification, exchange of information and consultation in assessing the environmental impacts of such plans, programmes and projects, taking into account Article 19 of this Protocol and Article 4(3)(d) of the Convention".

This rule could be a way to make the protection of coastal areas effective, thus avoiding that the wrong practices of a Country end up depriving the good practices of neighbouring countries of value and effectiveness.

With specific reference to coastal erosion, Article 23 commits States to take the necessary measures to preserve or restore the natural capacity of the coast to adapt to changes, including those caused by sea level rise.

Furthermore, an important passage indicates that, when considering new works or activities in coastal areas, including maritime works and coastal defence interventions, States must take into particular account the negative effects of coastal erosion and the direct and indirect costs that may result. The Parties undertake to prevent the impacts of coastal erosion through integrated management of activities, including adoption of special measures for coastal sediments and coastal works. In this regard, it should be noted that, with reference to the regulations in force in Italy, the current Environmental Impact Assessment (EIA) procedures are not properly aimed at coastal erosion issues and are generally poorly adapted to the understanding of erosion processes. The National Strategy on Climate Change, in fact, as far as works subject to EIA (Environmental Impact Assessment) are concerned, states that environmental

4.4 EU LEGISLATION

On the subject of sustainable coastal planning and management, the European Union's legislation also comes into play, including the (less recent) legislation that is not specific on this subject, but which is clearly intended to have an impact on decision-making processes concerning the use and, at the same time, the protection of coastal areas. The examination of the European legislation, then, dutifully, starts from the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural and semi-natural habitats and of wild flora and fauna (Habitat Directive). The Annex I named "Types of natural habitats of community interest whose conservation requires the designation of special areas of conservation" identifies, among others, marine waters and tidal environments, sea cliffs and pebble beaches, maritime dunes of the Mediterranean coasts.

This regulation provides that Member States or, in exceptional cases, the European Community itself, designate specific protected areas, Community Importance Sites (SCIs) and Special Protection Areas (SPAs), as well as Directive 79/409/EEC (Birds Directive). These two regulations, together, constitute the Natura 2000 Network, i.e. an ecological network spread throughout the Union (SCIs and SPAs). The areas that make up the Natura 2000 network are not rigidly protected reserves where human activities are excluded. In fact, the Habitat Directive aims to guarantee the protection of nature while also taking into account "economic, social and cultural needs, as well as regional and local peculiarities" (Article 2). Private entities can be owners of Natura 2000 sites, ensuring sustainable management both from an ecological and economic point of view.

impact studies should compulsorily take into account changes in the reference climatic conditions that may occur for a period corresponding to the average life of the work.

It also stresses the need for sharing scientific data between States.

Protocol VII is intended to affect the internal planning of soil by individual states, which will have to adopt a global perspective.

The regional experience of Apulia, through the Coastal Plan, is an interesting example of integrated coastal management, that will be examined below.



The Habitats Directive (92/43/EEC) and the Birds Directive (2009/147/EEC) require Member States to identify and protect areas, including coastal and marine areas, for the conservation of the species or habitats they host. To protect these areas, Member States must establish the necessary conservation measures, including, where necessary, appropriate site-specific management plans or integrated into other plans, as well as appropriate legislative, administrative or contractual measures for their protection.

The existence of such sites will also have to be taken into account when it comes to coastal planning which requires a strategic assessment and, therefore, to answer questions regarding the value and function of the coast.

The Habitats Directive (Article 6), provides for the "Assessment of plans and projects significantly affecting Natura 2000 sites" (acronym VIncA in Italy) - the impact assessment - which must be adopted in relation to planning and spatial planning, in order to carry out an assessment of the naturalistic-environmental value of that territory in order to avoid the approval of spatial management instruments that conflict with the conservation needs of habitats and species of Community interest.

In Italy, indications and technical tools of reference provide a series of guidelines aimed at supporting all those who are involved at various levels in the task of identifying and developing appropriate conservation measures to manage the Natura 2000 network sites.

Directive 2000/60/EEC is also of interest, which establishes a framework for

community action in the field of waters (coastal) and is closely connected with the ICZM Protocol.

This Directive establishes a framework for Community action in the field of water policy and introduces an innovative approach to European water legislation, both from an environmental and an administrative and managerial point of view.

The Directive establishes that the individual Member States shall address the protection of water at the level of "river basin" and the territorial unit of reference for the management of the basin is identified in the "river basin district" (eight river basins have been identified in Italy). A "river basin" is an area of land and sea, consisting of one or more adjoining river basins and the related groundwater and coast.

Instead, Directive 2007/60/EEC concerns the "Assessment and management of flood risk".

For coastal areas, it provides for the adoption of specific risk management plans based on the level: low, medium or high.

The Directive contains provisions regarding the coastal erosion issue under a "precautionary" aspect, with the aim of anticipating possible damage to the coastal strip through a scientific risk analysis.

The formulation process, implemented nationally through Legislative Decree No. 42/2010, led to the adoption in December 2015 of the first Flood Risk Management Plans also including coastal areas.

Among the tools of soft law, there are the European Communication COM/2000/547 on integrated coastal zone

management and the Recommendation 2002/413/EEC concerning the implementation of integrated coastal zone management in Europe (ICZM). The first one introduces a strategy for Europe (ICZM) which states (paragraph I.A.): "The coastal zones of Europe face a range of interrelated bio-physical and human problems. The basic bio-physical problem in the coastal zones is that development is not kept within the limits of the local environmental carrying capacity". Among the problems, there is "widespread coastal erosion, often exacerbated by inappropriate human infrastructure (including that intended for "coastal defence") and development too close to the shoreline. Engineering works in some port areas have contributed to accelerated erosion of the adjacent shoreline because the works did not adequately account for coastal dynamics and processes. Extraction of gas is another factor that can lead to coastal erosion" (paragraph I.A.). The second one, although it is not binding, represents the first European provision on integrated management. Its importance lies in the fact that the European Union itself takes into consideration the "integrated" approach to managing the coastal strip as a whole. On the assumption that it is "essential to implement an environmentally sustainable, economically equitable, socially responsible, and culturally sensitive management of coastal zones, which maintains the integrity of this important resource while considering local traditional activities and customs that do not present a threat to sensitive natural areas and to the maintenance status of the wildspecies of the coastal fauna and flora", Member States are invited to address the issue of "protection of the coastal environment, based on an ecosystem approach preserving its integrity and functioning, and sustainable management of the natural resources of both the marine and terrestrial components of the coastal zone" (Cap. I. a)). It takes into consideration the threat, for coastal areas, of the growing erosion phenomenon.

Sustainable coastal management requires that the various interests underlying the use of state property be taken into account: on the one hand, therefore, the conservation and defence of coastal state property (in particular against erosion) and, on the other, economic and social interests.

Traditionally maritime countries, which are largely bathed by the sea, cannot but find the synthesis between these apparently opposing needs. On the other hand, the economy linked to coastal areas and their good state is at stake. The chain of activities related to the sea resource has a large number of employees and is a driving sector for the economy of a traditionally maritime country as Italy is. As has been said, human activities linked to the sea are often the cause of the phenomenon of coastal erosion, so that they end up damaging the asset (coast and sea) which they necessarily need to exist. There are three pieces of EU legislation which, although not binding on Member States as they do not impose legal obligations, are absolutely important texts as they suggest principles and lines of action to which, hopefully, Member States' activities must



conform, as well as guidelines for future regulatory proposals, linking human activities related to the sea, with which it is clear that there is growing interest as an instrument of economic growth, with the concepts of sustainable growth and the need for planning of coastal areas and maritime spaces, which are also fundamental concepts in the fight against erosion.

The first one is the Communication of the 2012 European Commission on Blue Growth - Opportunities for sustainable growth in the marine and maritime sectors.

This is the long-term strategy to support sustainable growth in the marine and maritime sectors. It considers the seas and oceans as an engine for the European economy for ensuring effective and sustainable management of activities at sea.

The Blue Economy includes traditional sectors such as fishing, offshore oil and gas extraction, maritime transport, port activities, shipbuilding and coastal tourism, as well as new sectors such as marine energy, marine biotechnology and seabed mining, coastal protection, desalination.

The strategy is divided into three components, which include the planning of maritime space for ensuring an effective and sustainable management of activities at sea, and integrated maritime surveillance.

Coastal and maritime tourism is included among the five priority areas of intervention that will allow sustainable growth and job creation in the blue economy.

In this document, the following relevant

sentences can be underlined: "The sea and the coasts are drivers of the economy" (par. 1) (...) "The individual sectors of the blue economy are interdependent. They rely on common skills and shared infrastructure such as ports and electricity distribution networks. They depend on others using the sea sustainably" (par. 2). "A healthy environment is fundamental to any form of 'blue' tourism and favours the growth potential of new forms of tourism. High quality bathing waters and pristine coastal and marine habitats have a high recreation value. This increases the attractiveness of coastal areas which in turn increases the growth potential of activities such as nautical tourism and sports" (par. 5.3).

It is clear from this Communication that coastal planning, even with regard at tourism activities themselves, is fundamental in order not to impoverish the coastal landscape because, otherwise, there would be a negative impact on tourism itself.

The second one is the European Parliament Resolution of July 2013 on Blue Growth - improving sustainable growth in the marine, maritime transport and tourism sectors.

On the maritime space planning and integrated coastal zone management, "welcomes the Commission's legislative proposal for Maritime Spatial Planning (MSP) and Integrated Coastal Management (ICM) as measures necessary for managing the increasing number of maritime and coastal activities and protecting the marine environment, ensuring that various activities can coexist harmoniously and avoiding conflict over the use of coastal and sea areas; considers it necessary in this regard to opt for an ecosystems-based approach to the management of human activity on the coast and at sea" (par. 17); "Believes that the land-sea interface needs to be strengthened in the context of spatial planning in order to safeguard continuity of human activities and of the supply chain and ensure that coastal areas are properly connected with their hinterland; believes that this could help avoid the phenomenon of coasts being treated as borders" (par. 20). In addition, in terms of coastal tourism: "Calls for tourism to be promoted and sustained as a driver for growth and jobs in coastal areas; takes the view that a healthy environment is fundamental to any form of tourism in coastal regions and that every effort must therefore be made to protect it (...) (par. 52)"; "Emphasises that the erosion of the European coastline, the safeguarding of Europe's environmental and animal heritage, and the improvement of water quality remain important issues to be tackled" (par. 53). The last one is the European Communication 2014 - European strategy for greater growth and employment in coastal and maritime tourism. In this case the key-word is Strengthening sustainability and addressing pressures on the environment. "Tourism depends on a healthy environment and the sustainable use of natural capital, but activities are often concentrated in already densely populated areas, leading to vast increases in water demand, more waste and emissions from air, road and sea transport at peak periods, more risks of soil sealing and biodiversity degradation (from infrastructure developments), eutrophication and other pressures... Integrated Coastal Management and Maritime Spatial Planning help ensure sustainable and Green Infrastructure development through smart planning and cooperation between government, public and private partners" (par. 3.3). The state of the art on blue economy growth is outlined in the EU Blue Economy Report 2019, prepared by the Directorate-General for Maritime Affairs and Fisheries (DG MARE) and the Joint Research Centre (JRC) of the European Commission. Defining the performance of blue economy activities, distinguishing between traditional and new activities, this document represents an important knowledge base for those who are called to find a balance between the use and conservation of the sea and coastal areas. With reference to the individual sectors of the blue economy, documents have been drawn up which are useful for translating the regulatory forecasts into practical actions. They are:

- Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions of 2013 - Strategic guidelines for the sustainable development of aquaculture in the EU which have been translated into the Strategic Plans for Aquaculture 2014-2020 adopted by the Member States;

- Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions of 2014 - Blue Energy – Action needed to deliver on the potential of ocean energy of Europe's seas and oceans by 2020 and beyond. This is a Blue Energy Action Plan to achieve the potential of ocean energy, accompanied by an Impact Assessment and studies aimed



at implementing knowledge on possible applications of blue biotechnology and the exploitation of deep-sea mineral deposits. Finally, it should be noted that, in May 2018, the European Commission published the Communication on the next Multiannual Financial Framework post 2020: 6.14 billion euros were dedicated to maritime affairs for the period 2021-2027.

4.5 IN-DEPTH: THE MARINE STRATEGY

The Directive 2008/56/EC-Marine Strategy Framework Directive - establishes a framework for Community action in the field of marine environmental policies, providing guidance on the need for integration and complementarity of the different instruments and for a unified vision. This Directive was implemented in Italy with Legislative Decree no. 190/10, which sets as its main objectives the protection and preservation of the marine environment and the adoption of measures necessary to maintain a good environmental status by 2020.

According to the Directive, each State must therefore implement, for each marine region or sub-region, a strategy consisting of a "preparation phase" and a "programme of measures"³.

The Directive has divided European marine waters into four regions: the Baltic Sea, the North-East Atlantic Ocean, the Mediterranean Sea and the Black Sea. Three sub-regions have been identified in the Mediterranean: a) the Western Mediterranean, b) the Adriatic Sea and c) the Ionian Sea and the Central Mediterranean.The Italian waters belong to all three sub-regions.

Given the transboundary nature of the marine environment, Member States are called upon to cooperate to ensure that their strategies are developed in a coordinated manner for each marine region or sub-region. In addition, to ensure healthy and productive clean marine waters, it is essential that these strategies are coordinated, coherent and well integrated with those required by existing Community legislation (such as transport, fisheries, tourism, infrastructure, research) and international agreements.

The Directive requires Member States to develop a marine strategy based on an initial assessment, the definition of good environmental status, the identification of environmental targets and the establishment of monitoring programmes.

Good environmental status of marine waters means the ability to preserve ecological diversity, the vitality of the seas and oceans so that they are clean, healthy and productive while maintaining the use of the marine environment at a sustainable level and safeguarding the potential for the uses and activities of present and future generations.

To enable Member States to achieve their objectives, the Directive developed eleven descriptors describing the ecosystem once good environmental status has been achieved.

99 Currently, the second cycle of implementation of the Marine Strategy (2018-2020) is underway:

- Evaluation GES and TARGET
- → Monitoring programme
- \bigcirc Programme of measures

4.6 IN-DEPTH: SPATIAL SEA PLANNING

There are several activities that are normally carried out at sea. There are different sources of regulation governing them, with the consequent attribution to different bodies of the relative administrative competences. The aim of the Directive 2014/89/EU is to overcome this fragmentation through a new tool, the one of "maritime spatial planning", which outlines a new administrative procedure, which allows to jointly take into account the different interests involved and, therefore, the different regulations of the sector, with a view to efficiency and sustainability of human activity, following an integrated approach. Article 5 provides that "through their maritime spatial plans, Member States shall aim to contribute to the sustainable development of energy sectors at sea, of maritime transport, and of the fisheries and aquaculture sectors, and to the preservation, protection and improvement of the environment, including resilience to climate change impacts. In addition, Member States may pursue other objectives such as the promotion of sustainable tourism and the sustainable extraction of raw materials". This instrument should make possible to organise maritime space by balancing competing interests and activities, which should also have a positive impact on environmental protection, since this type of planning must be carried out with a view to the sustainable use of resources.

This type of planning should also create greater legal certainty and transparency in the activity of public administrations and, therefore, encourage (sustainable) investments in the field of the blue economy. Maritime Spatial Planning is a key tool for implementing blue growth.

In essence, maritime spatial planning pursues and coordinates European regulations that affect the different sectors of activity that can take place there. This Directive is closely linked to the Directive 56/2008/EU - Marine Strategy. The planning required by the Directive is therefore proposed as a "cross-sectoral" instrument enabling public authorities and stakeholders to apply an "integrated and coordinated approach". This Directive is closely related to the Marine Strategy and the Protocol on Integrated Coastal Management, of which it can be an implementation tool.

³ From http://www.strategiamarina.isprambiente.it/

Interreg Greece-Italy

The key-word is the eco-system approach: this is a method of managing all resources in a way that strikes a balance between use and conservation.

The scope of the Directive is the "marine waters" corresponding to the waters and their seabed and subsoil, situated beyond the baseline used to measure the extent of the territorial waters (article 3 of Directive 2008/56/EC). Coastal waters, i.e. waters between the baseline and one nautical mile (Article 2(7) of Directive 2000/60/EC) and their seabed and subsoil, to which terrestrial spatial planning applies, are excluded.

According to the maritime spatial planning Directive, "possible activities and uses and interests may include: aquaculture areas, fishing areas, installations and infrastructures for the exploration, exploitation and extraction of oil, of gas and other energy resources, of minerals and aggregates, and for the production of energy from renewable sources, maritime transport routes and traffic flows, military training areas, nature and species conservation sites and protected areas, raw material extraction areas, scientific research, submarine cable and pipeline routes, tourism, underwater cultural heritage" (article 8). Planning must be participatory (article 9) and cooperation between States sharing a basin is necessary to ensure the coherence and effectiveness of the Plans themselves. This Directive was introduced in Italy by the Legislative Decree 201/16.

This provision, as required by the Directive, identifies the competent authority for the implementation of the directive - the Ministry of Infrastructure and Transport which is also responsible for the process of maritime planning, providing, in article 6, paragraph II, that "for each marine sub-region (are adopted) the guidelines containing the addresses and criteria for the preparation of plans for the management of maritime space and the identification of maritime areas of reference, as well as the relevant landbased interactions".

There is also an inter-ministerial technical committee that deals with the elaboration of management plans, the classrooms are approved by decree of the Minister of Infrastructure and Transport.

The decree requires to take into account the interactions between land and sea. It expressly provides, in fact, that account must be taken of "land-sea interactions, including through the use of elements contained in other planning processes, such as integrated management of coastal areas or equivalent practices, formal or informal" (article 4, paragraph 2, letter c)).

Further reference to ICZM can certainly be found in article 5(3), where it is envisaged to "include and harmonise" the provisions of maritime spatial management plans with existing plans and programmes.

The Ministerial Decree of 1 December 2017 approved the Guidelines provided by Legislative Decree no. 201/16 that establishes the addresses and criteria for drawing up the management plans of the maritime space, the procedure to be followed, and identify the maritime areas for their application together with the land areas to be taken into account for the purposes of land-sea interactions. The guidelines also provide guidance on the content of maritime spatial management plans, in addition to those given by the directive.

They identify three maritime areas, as the Western Mediterranean Sea, the Adriatic Sea, the Ionian Sea together with the Central Mediterranean Sea, which correspond to the three sub-regions provided for by Legislative Decree no. 190/2010 which implemented the marine strategy. With the management plans it will be possible to identify further sub-areas, in relation to characteristic and distinctive features from the morphological and eco-systemic point of view, as well as from the point of view of landscape, historical, economic, productive, socio-cultural characteristics (chapter 13.2 of the guidelines).

The objectives highlighted are those set out in the directive on maritime planning, namely: the Marine Strategy, the National Strategy for Sustainable Development (Law no. 221/2015) and existing plans and programmes.

The Guidelines state that these Plans must be subject to the Strategic environmental assessment (SEA) and Assessment of plans and projects significantly affecting Natura 2000 sitesprocess (chapter 14), which guarantees the application of the eco-systemic approach (see art. 6, paragraph 2, of Legislative Decree no. 152/2006). The SEA procedure must be initiated at the same time as the plan formation process (chapter 18).

The ecosystem approach is very important because "it represents the main instrument for the correct development of Maritime Spatial Planning, playing a role of connection between the MSP and the MSFD".

The Guidelinesalso establish that MSP must be consistent with the Marine Strategy and Integrated Coastal Management (ICM).

The Guidelines require that all planning levels affecting coastal and non-coastal systems must be taken into account and identify some of the Plans that can intersect with MSP.

Given its character as an integrated plan, the maritime spatial management plan has a reference role for other sectoral plans. In the first application, as mentioned above, the Maritime Spatial Management Plans will have to take over the existing planning, then the Maritime Spatial Management Plans will design an integrated framework within which the sectoral plans will define their sectoral objectives and actions (see chapter 14).

A list of the plans and programmes that can can be related with MSP is varied. A list is contained in the Guidelines, Annex 4 - "The Framework for the National and Regional/Local Planning System in Italy". It includes "integrated coastal zone planning (ICZM) and similar" adopted in some Regions and the standard refers to regional territorial and landscape plans and their development indications for coastal areas (M. Roversi Monaco, La pianificazione marittima in Italia: un percorso in atto, in Federalismi.it - Rivista di diritto pubblico italiano, comparato, europeo), 10 october 2018), as well as to the Municipal Coastal Plans introduced for example in Apulia, which have an impact on the use of space and resources at the land/sea interface.

As for the former, they are a regional competence pursuant to Article 70, paragraph 1, letter a, of Legislative Decree no. 112/1998 (which refers to tasks of protection and observation of coastal areas) and Article 89, paragraph 1,



letter h, of Legislative Decree no. 112/1998 (which refers to the planning and integrated management of coastal defence interventions and coastal settlements). These are tools for planning the use of the coastal maritime state property by the Region, which constrain the granting of rights of use, prepared in accordance with the Article 6 of the Legislative Decree no. 400/1993.

The Legislative Decree no. 201/2016, with reference to the different types of already existing plans and programmes concerning marine waters and the economic and social activities carried out there, as well as those concerning land activities relevant for the consideration of land-sea interactions, establishes that they are (in a first application) included and harmonised with the provisions of the plans for the management of the maritime space (Article 5, paragraph 3), so that their content can be modified precisely in order to be consistent with the provisions of the plan. Once the maritime spatial management plan has been drawn up, it will be the reference for the individual sectoral plans, drawing up the framework within which the sectoral plans will define their objectives and sectoral actions (chapter 14 of the guidelines).

It has been said that MSP prevails over other sector plans. However, this requires collaboration between institutional levels, therefore, the chapter 2 provides that "the Technical Committee shall ensure, in accordance with the principle of loyal collaboration, the effectiveness of the co-planning State-Regions where the planning process affects matters in which the latter have exclusive or concurrent legislative competence".

The Regions, in any case, are represented on the Technical Committee.

Unlike the Regions, the Municipalities, on the other hand, have only the possibility to participate in the procedure.

However, in relation to the level of municipal planning, the Guidelines expressly provide (chapter 13) that "The Directive does not apply to coastal waters or parts of them that fall within the urban and rural planning governed by existing legal provisions of the Member States, it being understood that the management plans of the maritime space take into account the aforementioned urban and rural planning in order to ensure consistency between their respective provisions and ensure that the processes of maritime spatial planning take into account the interactions between land and sea (as expressly mentioned in several parts of the Directive 2014/89/EU)".

Finally, the Guidelines stress the importance of management plans "being consistent and in synergy with the planning of Member States and non-Member States but neighbouring States. To this end, it is useful to provide for the participation of these countries in national planning from the earliest possible moment" (chap. 15). For this reason, a draft proposal for a plan is to be submitted for public consultation, including cross-border consultation (chapter 18).

4.7 ITALIAN LEGAL FRAMEWORK

In the Italian regulatory framework, the first law to defend the coast and the sea is found in Law no. 979/1982 - "Provisions for the defence of the sea". However, it essentially takes into account the issue of protection from pollution. Nevertheless, it is a fundamentally important piece of legislation. It introduces the general plan for the protection of the sea and its coasts against pollution and for the protection of the marine environment, which "directs, promotes and coordinates interventions and activities in the field of the defence of the sea and the coasts from pollution and the protection of the marine environment, according to planning criteria and with particular emphasis on the forecasting of potentially dangerous events and the interventions necessary to delimit their effects and to contrast them once they have been determined".

Together with the Law no. 394/1991, it regulates Marine Protected Areas, which serve to conserve the marine environment and promote the ecological use of resources.

Another extremely important forecast, especially with reference to the issue of coastal erosion dealt with here, is contained in the Law no. 431/1985, which defines the coastal strip in the first 300 m and considers it as a property to be subject to constraint landscape.

The articulation of responsibilities in the field of coastal defence has undergone a slow, but important, evolution over time: responsibilities on the coast passed from the State through the Regions. This step is very useful because the regional level appears to be optimal for the implementation of policies of integrated planning and management of the coasts (M. Bertollini, La gestione integrate dei paesaggi costieri in Italia. Stato dell'Arte ed applicazione nel panorama italiano, ISPRA).

The first assignment of responsibilities to the Regions was only partial and was made by the Presidential Decree no. 616 of 24 July 1977.

The Article 69, paragraph 6, of the Presidential Decree no. 616 of 24 July 1977 attributes the first powers in matters of coastal defence to the Regions. It reads as follows: "The Regions may also provide for coastal defence works affecting their territory with the permission of the State". The Regions, therefore, have the power to provide for the works preserving coasts, even if with the prior authorization of the State, while the Regions have been delegated the "administrative functions on the coast, on the state property areas immediately facing, on the areas of lake and river state property, when the intended use has tourist and recreational purposes".

Then, by the Legislative Decree no. 400 of 5 October 1993 (passed, with amendments, into the Law no. 494 of 4 December 1993), the administrative functions for matters related to government grants were delegated to the Regions. Concerning granting rights, the preparation of a Plan for the use of the areas of the maritime state property is envisaged.

The definitive transfer of powers to the



Regions in the field of coastal defence took place with the Legislative Decree no. 112/1998. The Article 70(1)(a) provides that: "All administrative functions (...) are conferred to the regions and local authorities and among these, in particular: the tasks of protection and observation of coastal areas", while, pursuant to the Article 89, paragraph 1, letter h), "all functions relating to the planning, management and integrated management of coastal defence interventions and coastal settlements are conferred to the Regions and local authorities".

With the Law no. 179/2002 (Provisions on environmental matters), the responsibility over the coast is definitively attributed to the Region. The Article 21 - "authorisation for interventions to protect the coastal strip", in fact, provides: "for interventions to protect the coastal strip".

Legislative Decree No 42/2004 - "Code of Cultural Heritage and Landscape" - introduces a relevant provision because coastal areas "included in a strip 300 metres deep from the shoreline, even in the case of high land on the sea" are recognised as being of "landscape interest", with the result that they are subject to the rules laid down therein (included in the Landscape Plan) (see article 142(I)(a)).

The Law no. 431/85 already identified the coastal strip in the first 300 m and considered it as a property to be subject to landscape restrictions.

This results in a building ban in coastal areas, with a clear reduction of anthropic pressure on these areas.

Another important text, not only in terms of coastal defence, is represented by the Legislative Decree no. 152 of 3 April 2006 - "Environmental Code" - as amended and supplemented.

It contains an evolution of the concept of protection of the marine environment and the coasts, no longer focused only on the issue of pollution.

This law, in the second part, regulates the various procedures aimed at assessing risks to the environment (SEA, IPPC, etc.) and, in the third part, the Rules on soil protection and combating desertification, protection of water from pollution and management of water resources. With respect to this issue, article 56, paragraph 1, letter g), provides that the programming, planning and implementation activities of the interventions aimed at pursuing the objectives of protection and restoration of the soil and subsoil, the hydrogeological remediation of the territory through the prevention of instability phenomena, the safety of situations at risk and the fight against desertification as in the article 53, "also concern the protection of coasts and settlements from invasion and erosion of the dune cords".

Pursuant to the article 57, the State determines the general guidelines and defined criteria.

Finally, the Legislative Decree no. 49 of 23 February 2010 - "Implementation of Directive 2007/60/EC on the assessment and management of flood risks" - implements the European Directive on flood risk management and provides for the perimeter of areas subject to marine flooding in order to reduce the negative consequences for human

health, for the territory, for property, for the environment, for cultural heritage and for economic and social activities deriving from the floods/inundations themselves.

Recently, National guidelines for protection against erosion and the effects of climate change 2018 have been issued. They provide technical indications on the works specifically aimed at protecting the coast against the phenomenon of coastal erosion.

The Guidelines "provide an overview and set up a series of experiences and good practices developed in recent decades, with particular attention to the defence actions concerning the control of the coastline, the rebalancing of the cycle of sediments, the protection and adaptation of coasts in relation to the physiographic context, the degree of effectiveness and durability of different solutions".

The Guidelines have been prepared by the National Table on Coastal Erosion composed by the Ministry of Environment and Territory Protection and Regions with the technical coordination of ISPRA. The general objective that the Ministry has proposed with the establishment of the National Table on Coastal Erosion is to define the "general guidelines and criteria for coastal defence" as referred to in the article 88, paragraph 1, letter "aa" of Legislative Decree no. 112/98 as a specific task of national importance.

Considering that the Regions are assigned the functions related to "the planning and integrated management of coastal defence interventions and coastal settlements" (article 89, paragraph 1, letter h, Legislative Decree no. 112/98), the Ministry of the Environment has considered it essential to start the path for the definition of "general guidelines and criteria for the defence of the coast" through a technical comparison with all the coastal Regions.

The Guidelines are intended to be an operational tool to aid decisions for all operators in the sector (public and private) on how to intervene in the coastal territory. The Guidelines outline a "coastal model". They consider that planning is a crucial process, in which a shared vision between Public Administrations and stakeholders is defined for the future, with objectives of coastal planning, security and development also in relation to the expected effects of climate change. The Guidelines also refer to the process and principles of Integrated Coastal Zone Management (ICZM), as they are necessary to operate with a unified and integrated vision of the various anthropogenic and natural elements that interact on the coast, in particular and with particular emphasis also addressing the problem of coastal erosion and adaptation to climate change.

Finally, it is important to underline that the choices of strategies, options, measures and actions to defend the coasts from erosion and marine ingression will always have to be compared and, where appropriate, aligned and contribute to the contents, objectives and measures of the current basin planning (PAI, Coastal Plans, etc.), of the district planning (Water Management Plan, Flood Risk Management Plan), of the planning of the Protected Natural Areas, of the main regional planning tools with a direct impact on the coastal areas.



4.8 APULIAN REGIONAL LEGISLATION

The Apulia Regional Council has issued a number of measures aimed at tackling the major critical issues related to coastal erosion, focusing on coastal maintenance activities and techniques for the use of the same natural resources.

With the resolution of the Regional Council no. 410/2011 the Apulia Region has approved the "Guidelines for the identification of interventions aimed at mitigating the most critical situations of the low Apulian coasts".

These Guidelines state that all interventions aimed at mitigating the situations of instability and erosion in general of the low Apulian coasts must be consistent with the "Preliminary studies for the preparation of the Plan for the removal of the Coastal Dynamics" (approved by the Technical Committee of the Apulian Basin Authority on 29/11/2010).

With the Resolution no. 229 of 22 June 2015 of the State Property Manager of the Region of Puglia, the "Guidelines for the management of plant biomass from the beach" of the Region of Puglia were approved.

In order to counter the phenomenon of coastal erosion, these Guidelines provide some options for the management of such biomasses. In order to identify the most suitable management option for the Beach Plant Biomass applicable in the coastal areas of the Apulia Region, the Apulian coastal macrotypes have been preliminarily identified.

The Regional Council Resolution no. 1694/2018 – "Operational guidelines for the Action to Combat Regional Coastal Erosion and start of Phase 1 of the Programmatic Framework - Preliminary Studies" alsovery interesting. Since tourism has become one of the pillars of the Apulia region's economy and the careful and conscious use of the region's natural and landscape resources can contribute, together with territorial planning and recovery and redevelopment projects, to the enhancement and conservation of the resources themselves, the Programme Framework for the fight against coastal erosion was approved, together with the Scheme of contents of the Regional Coastal Morphodynamic Plan and the Scheme of Agreement between the Puglia Region and the Polytechnic University of Bari for the implementation of research activities on regional coastal dynamics, aimed at analysing the risk of the causes of erosion phenomena and the remedies that can be implemented.

There is also the Resolution of the Regional Council no. 1197/2019 - "Guidelines for the seasonal maintenance of beaches" - which establishes: "From the point of view of the integrated management of the coasts, the seasonal maintenance operations of the beaches pursue the aim of maintaining the natural aspect of the same and, with the criteria and tools provided by this document, where necessary, restore only the trend of the shoreline, as recently documented, without altering the state of the places. Such interventions, therefore, should not be understood as works intended to combat coastal erosion or sea defence works, as they aim solely at the redistribution of sediments belonging to the active strip of beach of the same site" (Part I(c)).

4.9 IN-DEPTH: RULES ON THE PROTECTION AND USE OF THE COAST IN APULIA

The Apulia Regional Law No. 17/2015 regulates the administrative functions for the management of the maritime state property and territorial sea areas conferred by the State pursuant to Article 117 of the Constitution, identifying the functions retained by the Region and those conferred to the municipalities. This law has replaced, in large part taking over, the Apulia Regional Law No. 17/2006 which had already introduced the Regional Plan of the coasts (approved in 2011).

This provision refers to the integrated management of the coast, which deals with administrative functions for the management of the state property. This management activity complies with the principles of "coastal area planning", as well as "safeguarding, protecting and using the environment in an environmentally sustainable manner".

In essence, the protection of the marine environment is entrusted to this regional legislation, which is based on the Regional Coastal Plan and, therefore, on the Municipal Plans, which, in turn, must be based on the principles and rules of the Regional Coastal Plan (see articles 1 to 2). The Regional Coastal Plan (approved in 2011 pursuant to the previous Regional Law No. 17/2006) contains the results of various study activities, including: 1) the reorganization and updating of information and technical-scientific knowledge of the physical dynamics taking place on the coastal territory of Apulia; 2) the definition of the cognitive framework of environmental characteristics and

urban and administrative dynamics and the cataloguing and rational organization of existing data; 3) the definition of policies for the use of the state property areas of the coast, to be implemented in compliance with environmental and urban constraints, as well as the safety of citizens; 4) the criteria and guidelines for the drafting of the Municipal Plans of the Coast, a tool for planning, management, control and monitoring of the coastal municipal territory.

The technical implementation rules and general guidelines for the drafting of Municipal Plans for the coasts clarify that "The Regional Coastal Plan (PRC) is the instrument that regulates the use of the areas of the Maritime State Property, with the aim of ensuring the correct balance between the protection of the environmental and landscape aspects of the Apulian coast, the free enjoyment and development of recreational tourism activities. The general model of integrated management of the coastpursues the essential objective of economic and social development of coastal areas through criteria of eco-compatibility and respect for natural processes. The PRC is also an instrument of knowledge of the coastal territory and in particular of the geomorphological and meteorological dynamics related to the priority problem of coastal erosion, the evolution of which requires careful and constant monitoring and coastal recovery and rebalancing interventions. (...) The PRC provides the guidelines, addresses and criteria to which the Municipal Coastal Plans (CCP)



must conform" (article 1) in order to pursue, in the integrated perspective of coastal development, the implementation of all activities directly and indirectly related to the sea preserving the landscape and natural heritage.

The Regional Plan of the coasts is based first of all on a precise characterization of the Apulian coastal morphotypes. The PRC has identified some priority interventions aimed at ensuring the enhancement and protection-integrity of coastal areas.

The drafting activities of the PRC have allowed important interdisciplinary exchanges to overcome the traditional fragmentation of different sectoral policies. For the drafting of the PRC, a multidisciplinary methodological approach was adopted that led to the categorization of the Apulian coast not into administrative units, but into physiographic ones (as homogeneous and unitary coastal-marine areas), the characteristics and critical points of which were identified in detail, also thanks to the contribution of knowledge from the various municipalities.

A particular attention was paid to concessions because census of the existing ones was made and the conditions that discourage or prevent the renewal of the existing ones were identified, such as the presence of blades, erosive phenomena, planned nourishments, etc.

A study was also carried out on the problem of coastal erosion and interconnections with water and soil protection policies were identified. , In order to manage administrative action correctly, article 6 provides that two factors must be taken into account, a) the criticality of erosion of sandy shores and b) the environmental sensitivity of the coast as well as defined in the PRC, providing that "the classes of criticality condition the granting of state concessions, while the classes of environmental sensitivity condition the types of state grants and the methods of containing their impacts".

So, in this way, the choices of public administrations must no longer consider the coast only in terms of urban planning but as a collective resource to be preserved. Moreover, the measures to be adopted.

As for the Municipalities Plans, the Technical Regulations for the implementation of the PRC provide (Article 2) more precisely, that it is the instrument of "planning, management, control and monitoring of the municipal coastal territory in terms of protection of the landscape, protection of the environment and guarantee of the right of citizens to access and free enjoyment of the public natural heritage, as well as discipline for its environmentally friendly use" and pursues the objective of economic and social development of coastal areas.

The Municipalities Coastal Plans "must also provide strategies for defence, environmental requalification and monitoring, and propose actions aimed at solving the problems caused by the main factors that currently contribute to the morphodynamic imbalance of the coastal strip, with reference to the entire physiographic unit".

Finally, technical regulations envisage that at least 60% of the length of the eligible coastline must be reserved for public use and bathing.

4.10 GREEK LEGISLATIVE FRAMEWORK FOR COASTAL ZONE MANAGEMENT

Facing the coastal erosion is fundamental for Greece considering the importance of the coastal zones in the Greece's economy — a country with some 16,300 km of coastline, 12 of its 13 administrative regions open to the sea, and coastal tourism accounting for 15-18% of national GDP. In the Greek regulatory framework, the protection of the environment is enshrined since 1975 under the Constitution of the Hellenic Republic.

The first Ministerial Decree (MD) «on the drawing up of guidelines and necessary actions for the management of the coasts» was published in 1981 (Governement Gazette -GG551 B'/1981). However, although this Decree acknowledged that a) a unified and comprehensive approach to the development and protection of the coastal zone to protect the natural and man-made environment as well as the resources of the coastal zone is required b) the settlement of conflicting and competing requirements must be faced through coordination of the actions of the Public Bodies in all sectors and levels c) public participation in protection and development programs is needed, did not legislate a real obligation for the State in terms of the relevant required policies and/or the required cross-sectoral coordination.

Later, general environmental laws on environmental protection like the Law 1650/86 (GG 160 A') "For the protection of the environment" and Law 3010/02 (GG 91 A ') "Harmonization of Law 1650/86 with the directives 97/11/EU and 96/61/

EU, delimitation process and regulations of water supply and other provisions" took care of coastal areas and ecosystems considering them as particularly sensitive that need protection. These laws set out the basic guidelines for the protection of the environment and together with national spatial planning constitute the environmental framework for managing and developing business activities in the coastalareaamongothers.Specifically,the Law 1650/1986 separates environmental concerns from natural processes design and defines the categories of protection zones as well as their permitted uses per case. Both in this context and the rational developments of cities, designation of marine or coastal land for residential development or productive activities is foreseen as well as the designation of areas as special protection due to their environmental value.

This framework is further specified for coastal areas by the Law 2971/01 (GG 285 A ') "Seashore, beach and other provisions", which in combination with the compulsory L. 1539/38 "On the protection of public lands" and the Law 1337/83 (GG 33 A ') "Expansion of urban plans, residential development and relevant regulations" and L. 2242/94 (GG 162 A') "Urban planning of second home areas in Residential Control Zones, protection of natural and built environment and other provisions" determine the general principles and procedures related to the management, use, preservation of the public character of the coastal area, but also the possibilities of development.



Special Presidential Decrees (PD), Joint Ministerial Decisions (JMD) or Ministerial Decision (MD) set out the procedures and the technical criteria for individual processes in coastal zones such as:

- (1) the definition of the coastal or old coastal zone (JM 1089532/8205/B0010/05 (GG 595 B ') "Defining elements of seashore and beach")
- (2) recording any illegal constructions (JM 1090652/6799/B0010/05 (GG 1393 B')) "Demolition protocols of buildings, constructions and works on a seaside beach and sea area")
- (3) granting the seashore for temporary use and service

of the bathers (JM 1047427/4612/B0010/02 "Concession, in exchange, of the right of simple use of the seashore and beach, to the Organizations of Local Self-Government of the First Degree") and (JM D10B1075164/2439/2013 "Amendment of no. D10B 1053970/1672 EX 2013 / 29-3-2013 of the JMD (GG 801 NW) on "Direct concession, in exchange for the right of simple use of the seashore, beach, coast and riparian zone of large lakes and floating rivers, in the Organizations First Degree Local Government and its codification").

Special legislation also specifies the management and protection of antiquities in the coastal and marine space (N 3028/02 (GG 153 APS) "For the protection of Antiquities and Cultural Heritage in general"). Finally, sanitary provisions determine the acceptable quality of the bathing water and the parameters of the seawater that should be monitored for this purpose.

The coastal zone legislation is complemented by national laws and directives of the EU issued for the protection and management of waters, either directly with reports in coastal waters or indirectly with references to groundwater and surface water. The main national institutional framework of harmonization with Water Framework Directive (WFD) 2000/60 is Law 3199/9-12-2003 (GG 280 A') on the "protection and water management - harmonization with Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000" as amended and in force and Presidential Decree 51/2007 (GG 54 A') "Determination of measures and procedures for the integrated water protection and management in compliance with the provisions of Directive 2000/60/ EC "establishing a framework for the Community action in the field of water policy" of the European Parliament and of the Council of 23 October 2000, in pursuance of the provisions of Article 15(1), Law 3199/2003". The Greek territory was divided pursuant to the Law 1739/1987 (GG 201 A') in fourteen river basin districts (RBD). The spatial competence of the West Region Greece extends for the most part to sections of the RBD of the Northern Peloponnese, the Western Peloponnese, the Western Central Greece, while a small area at the northern end of the prefecture Etoloakarnania occupies part of the RBD of Epirus. The compilation of the management plans in all these RBD was completed, approved and published in the GG by 2013. All coastal water bodies have been identified and their status has been examined. Several administrative measures like the prohibition of new sand-extraction or of extension licenses except in the cases of flood prevention by the Region's Civil Protection, the definition of coastal zones where the drilling of new wells for new water uses is prohibited to protect coastal WB from salinization etc. are included in the above mentioned Management Plans.

Water Framework Directive (WFD) is streamlined with the Floods Directive (FD) 2007/60/EC in order to increase the synergies of river basin management and flood risk management measures. The formulation process for the Directive 2007/60/EEC concerning the "Assessment and management of flood risk" implemented nationally in 2010 through the MD 31822/1542/E103 and led to the adoption of Flood Risk Management Plans for all river basin districts (July 2018). Coastal waters are assigned to these river basin districts as well as are groundwater bodies. Approved Flood Risk Management Plans evaluated under several scenarios all flood types risk (fluvial, pluvial, sea water, groundwater, artificial water bearing infrastructure) with a particular focus on riverine and coastal floods.

Both laws, implemented in coordination with each other, are linked, although indirectly, to Marine Strategy Framework Directive (MSFD) transposed into Greek national legislation through the Law 3983/2011 (GG 144 A) "National Strategy for the Protection and Management of the Marine Environment Harmonization with Directive 2008/56/EC of the

European Parliament and of the Council of 17 June 2008 and other provisions" and constitute the environmental pillar of the Greece's policy to maintain and restore the good environmental situation of the marine environment. The first action for the maritime strategy included (a) the preliminary assessment of the marine environmental situation, (b) the determination of the quality standards of the Good Environment and (c) the determination of environmental objectives - indicators of orientation towards the achievement of the Good Status, which were approved with a Decision of the Deputy Minister of Foreign Affairs (GG2939 B '2/11/2012).

Another fundamental tool for the sustainable development of marine and coastal zones and for the restoration of Europe's marine environment is maritime spatial planning. Maritime spatial planning aims at addressing the potentially accumulated problems of degradation of the marine and coastal ecosystem, to deal effectively with all those current issues related to the conflict of multiple marine activities that are now developing at sea, but also the risk of exceeding the carrying capacity of marine ecosystems, due to the intensive development of various activities⁴. The regulation and uses of the maritime space are very important for Greece and its economy, as they are directly related to the development and competitiveness of important sectors. In this context, maritime spatial planning is a critical issue, inextricably linked to the organization and development of maritime activities, with effects on employment and

⁴ Ehler, C. και Douvere, F. (2009), "Marine Spatial Planning: A step by step approach toward ecosystem-based management". IOC Manual and Guides No 53



investment opportunities for the Country, both in the context of its "Blue Development" strategy, EU and the new national development strategy under development ("National Development Strategy 2021")⁵. Law 4546/2018 (GG A' 101) "on the establishment of a framework for maritime spatial planning" and other provisions included in the Greek legislation the Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning". Concerns have been expressed, as the subject of the design includes the coastal zone, despite the contrary provisions of the Directive. This fact, according to the Association of Greek Industries, is expected to create serious legal obstacles, "as the coastal zone, as analyzed, is a dynamic concept, and in Greece (except that it has not been demarcated) its land sector is already regulated by forecasts of the Plans of Law 4447/2016 "6. Moreover, they underline that "the integration of Coastal Zone design in the context of Maritime Spatial Planning is a logic abandoned by the European Commission itself and for this reason, the Integrated Coastal Zone Management process is now seen as a distinct process." Climate change is expected to worsen problems that Greek coastal areas already face. The Greek total coastline length presenting medium to high vulnerability to sea level rise amounts to 3,360 km or 21% of Greece's total shoreline as well as the high rate of Greek coastline facing erosion since over 20% of the total coastline is currently under threat (EUROSION,2004) making Greece the 4th most vulnerable Country of the 22 coastal EU Member States⁷. The National Strategy for adaptation to climate change⁸ was approved by Law 4414/2016 (GG 149 A'), article 45. In addition, Law 4414/2016 (Articles 42 to 44) sets out the issues that should be included in the National Strategy for Climate Change Adaptation, the corresponding themes for Regional Climate Change Adaptation Plans and establishes the National Council for Climate Change Adaptation. According to this National Strategy, the effects on coastal ecosystems from climate change are expected to be huge while Regional Climate Change Adaptation Plans should identify and prioritize the necessary measures and actions for the adaptation of the Region to the upcoming climate change.

4.11 WESTERN GREECE REGIONAL FRAMEWORK FOR COASTAL ZONE MANAGEMENT

The Region of Western Greece is privileged in terms of the natural coastal environment. The region accommodates many, various and significantly sensitive ecosystems. Three of the eleven Greek aquatic habitats of international importance that have also joined in the Ramsar agreement are located in Western

Greece Region. These are: Lagoon of Messologi, Amvrakikos Gulf and Lake Kotychi9. The Western Greece has also, an extensive coastline and its total area is bordering with the Ionian Sea and the Gulf of Amvrakikos, Patras and Corinth. Within the European Habitats and Birds Directives, thirty-three areas located in

- ⁵ https://www.sev.org.gr/Uploads/Documents/52131/MELETI_final.pdf
- https://www.sev.org.gr/Uploads/Documents/52131/MELETI_final.pdf
- https://www.bankofgreece.gr/Publications/ClimateChange_FullReport_bm.pdf

https://www.depa.gr/wp-content/uploads/2020/02/06.04.2016-espka-teliko_.pdf

⁹ http://www.ekby.gr/ekby/el/PP_main_el.html

Wester Greece Region are included in the European Natura 2000 network and eleven out of those thirty-three are coastal areas¹⁰. In many cases, there is overlap between protected areas at national, European and international levels. Despite the large number of environmentally sensitive ecosystems, the guidelines of the applicable, since 2003, Regional Framework for Spatial Planning and Sustainable Development (G.G. 1470 B'/2003) have not been followed satisfactory in terms of protection and promotion of the natural environment, resulting in a lack of environmental protection infrastructures and so, the protection/conservation of those areas, including coastal areas, is insufficient. The upgraded role of sustainable development and spatial planning, in the context of European directions and policies, is reflected in the new spatial framework under approval.

The under approval Regional Framework for Spatial Planning and Sustainable Development was prepared in accordance with the Law 2742/99 (G.G./ A / 207 / 07.10.99) "Spatial Planning and Sustainable Development and other provisions" and took into account:

- (1) the General Framework for Spatial Planning and Sustainable Development (GPXSAA) (G.G. 128A/2008);
- (2) the Special Framework for Spatial Planning and Sustainable Development for aquaculture (G.G. 2505B/2011);
- renewable energy sources (G.G. 2464B/2008);
- (4) the Special Framework for Spatial Planning and Sustainable Development for Industry (G.G.151 Т.А.А.П./2009);
- Tourism (G.G1138B/2009).

The proposed Regional Framework for Spatial Planning and Sustainable Development categorizes WGR coastal zones on the basis of their characteristics like the degree of concentration and intensity of residential, holiday, tourist or other pressures, the existing or evolving of environmental degradation, the existence of protected areas, the grade of vulnerability to climate change. Additionally, this framework identified, recorded and evaluated the several pressures that impact coastal areas, such as uncontrolled diffusion and proliferation of residential uses, illegal water abstraction, sandblasting, land use conflicts.

(3) the Special Framework for Spatial Planning and Sustainable Development for (5) the Special Framework for Spatial Planning and Sustainable Development for



The strategic objectives and directions of this Regional Framework for coastal areas include:

- (1) Development of high-quality tourism in the coasts of WGR as well as *mild* and special forms of tourism (ecotourism, maritime tourism, etc.);
- (2) Protection and promotion of the natural and cultural environment and landscapes of the WGR through: a) the protection, the integrated management and the promotion of protected areas and landscapes of international, European Community and national importance, b) the implementation of actions to combat climate change, rational use and utilization of sustainable utilization of water resources, protection of the marine environment, the rational use of energy and mineral resources, the promotion of renewable energy sources and the improvement/completion of management infrastructure for solid and liquid waste.

The proposed Regional Framework for Spatial Planning and Sustainable Development recognizes that the important coastal zone and the shores of the WGR must be designed based on a policy of integrated management where the protection of coastal protected areas, the protection of the marine environment and the development of quality economic activities (tourism, fishing, fish farming etc.) will be combined. Moreover, it is recognized the urgent need to implement a special protection policy for the coastal zone to deal with the adverse effects of climate change and rising sea levels. This priority is critical for the WGR due to the long length of its coastline, which is characterized by medium and high vulnerability according the Regional plan for adapting to climate change being in phase of approvement. The proposed WGR's Regional plan for adapting to climate change contains six (6) actions including twenty one measures to protect coastal areas and rivers from flooding.

These six actions are:

- (1) knowledge and recording of climate change risks in the WGR's coastal zone;
- 2 preparation and implementation of an integrated management plan for WGR's coastal zone incorporating the parameter of climate change;
- (3) risk prevention and treatment actions;
- (4) Actions to deal with the effects of climate change on river floods;
- (5) integrating the effects of climate change on flood risk management planning in WGR:
- 6 soil protection from corrosion.

The WGR's Regional plan for adapting to climate change is fully compatible and associated with the three River Basin District Management Plans adaptable in WGR's areas [i.e. the River Basin District Management Plan of Northern Peloponesse and Western Peloponesse (G.G. 1004 B'/2003) and the River Basin District Management Plan of Western Sterea Greece (G.G. 2562 B'/2014)] as in force after their 1st approved revision (published in GG 4665 B'/2017, GG 4678B'/2017 and 4681 B'/2017

It is worth mentioning that those Management Plans contains several measures for protecting the significant WGR's coastal areas, like:

- () measures to control the emission of pollutants like a) the definition of principle
- 2 audits of the coastal waters that are being pressured from stormwater outfalls and monitoring water quality in aquaculture units;
- (3) measures to control the artificial recharge of groundwater aquifers like the GWBs;
- 4 administrative and related legislative measures like the prohibition of sandextraction and associated penalties;
- environmental agreement between the Management Authority of the protected area of the National Park of Mesolongi lagoons and the Authorities of fishermen and aquaculture in order to limit any possible negative effects of the extensive and intensive aquaculture on the status of the transitional and coastal water bodies and ecosystems.

for Nothern Peloponesse, Western Peloponesse and Western Sterea Greece respectively) and the related Approved Flood Risk Management Plans with their corresponding Strategic Environmental Assessment (published in GG 2640 B'/2018, GG 2686 B'/2018 and 2691 B'/2018 for Western Peloponesse, Western Sterea Greece and NothernPeloponesse respectively). All these projects are complementary and supportive of each other for the optimal management of the waters of the Region.

restriction zones for drilling new wells for new water uses and extensions of existing uses in coastal groundwater bodies where phenomena of seawater intrusion are observed and b) the definition and delimitation of areas of groundwater bodies that have poor quality due to seawater intrusion or exhibit local seawater intrusion; measures for point source pollution like the a) enhancement of the periodical other pollution sources, b) development of a regulatory framework/ guidelines for

Investigation of the conditions for application of artificial recharge of groundwater bodies as a measure to enhance the quantitative status and protect the quality of

(5) environmental agreements after negotiations like the initiatives on making an

EUROPEAN UNION STRATEGY FOR THE 5 **ADRIATIC AND IONIAN REGION (EUSAIR)**

The present chapter aims to examine the European Union Strategy for the Adriatic and Ionian Region (EUSAIR) which consists of four fundamental pillars:

- A Blue growth;
- B Connecting the region;
- c Environmental Quality;
- D Sustainable Tourism.

The final objective is to make proposals for the development of the Adriatic and Ionian strategy between the two countries involved in a sort of position paper.

The European Union, within its regional development policies and through the development of dedicated projects at interregional level, has developed, among others, the EUSAIR strategy which, according to the European Council, "has the capacity to contribute to the achievements of the objectives of the EUROPE 2020 Strategy¹¹, to ensure smart, sustainable and inclusive growth and competitiveness of the European Union, and to contribute to the reinforcement of existing EU horizontal policies¹²". In this context, since 2012, the European Union has adopted a number of documents and reports, the most important of which are the following ones.

11 The "EUROPE 2020 Strategy" has followed the "Lisbon Strategy" and has the aim "to boost European economy and promote a smart, sustainable and inclusive growth, based on a greater coordination of national and European economic policy" (http://www.efesme.org/europe-2020-a-strategy-for-smart-sustainable-and-inclusive-growth). It started with the European Commission comunication "COM(2010) 2020 final", adopted on 03 march 2010, which was followed by the European Council of 17 june 2010 where have been indicated the "Europe 2020" priorities: 1) Smart growth: developing an economy based on knowledge and innovation; 2) Sustainable growth: promoting a more resource efficient, greener and more competitive economy; 3) Inclusive growth: fostering a high-employment economy delivering social and territorial cohesion. In order to reach these priorities, the Commission has proposed five quantitative targets to fulfill by 2020: 1) 75 % of the population aged 20-64 should be employed; 2) 3% of the EU's GDP should be invested in R&D; 3) the "20/20/20" climate/energy targets should be met (including an increase to 30% of emissions reduction if the conditions are right); 4) the share of early school leavers should be under 10% and at least 40% of the younger generation should have a tertiary degree; 5) 20 million less people should be at risk of poverty

¹²Council conclusions on the European Union Strategy for the Ionian and Adriatic Region (EUSAIR), General Affairs Council Meeting, 29 septembe

Conclusions of the European Council (13/14 December 2012). The European Council set out the reasons behind the launch of the many macro-regional strategies, by stating

«The European Council agreed on a roadmap for the completion of the Economic and Monetary Union, based on deeper integration and reinforced solidarity. This process will begin with the completion, strengthening and implementation of the new enhanced economic governance, as well as the adoption of the Single Supervisory Mechanism and of the new rules on recovery and resolution and on deposit guarantees. This will be completed by the establishment of a single resolution mechanism. A number of other important issues will be further examined by the June 2013 European Council, concerning the coordination of national reforms, the social dimension of EMU, the feasibility and modalities of mutually agreed contracts for competitiveness and growth, and solidarity mechanisms and measures to promote the deepening of the Single Market and to protect its integrity. Throughout this process. democratic legitimacy and accountability will be ensured. The European Council launched work on the 2013 European Semester on the basis of the Commission's Annual Growth Survey. It decided to launch work on the further development of the EU's Common Security and Defence Policy and will return to this issue in December 2013».

In relation to the "EUSAIR" Project, the European Council expressed the following views:

«Recalling its June 2011 conclusions, and subject to the evaluation of the concept of macro regional strategies as foreseen in the Council conclusions of 13 April 2011, the European Council looks forward to the presentation by the Commission of a new EU Strategy for the Adriatic and Ionian region before the end of 2014. It also calls for the prompt implementation of the revised EU strategy for the Baltic Sea. In order to enhance co-operation with the neighbouring countries the European Council encourages the Council to take further action to make full use of the Northern Dimension and its partnerships»



Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Region on the Maritime Strategy for the Adriatic and Ionian Seas -30.11.2012 – COM (2012) 713. The Commission, with its Communication of 30.11.2012, identifies the objectives of the

Strategy.

EUSAIR has the main purpose of developing maritime activities in the Ionian-Adriatic area through the use of EU financial instruments (e.g.: ERDF, CF, ESF, EFF; FP7, LIFE+; EMFF; IPA Founds).

The Communication also identifies the four pillars on which the strategy should be based (Blue economy, Marine environment, Safety and security in the maritime space, Sustainability and responsibility in the exercise of fishing activities).

Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - concerning the added value of macro-regional strategies - 27.06.2013 – COM (2013) 468 - Final.

The European Commission, in its Report of 27.06.2013, updates the macro-regional strategies adopted, including the EUSAIR strategy.

Recalling the values of the macro-regional strategies (integration, coordination, cooperation, multi-level governance and partnership EU / non-EU Countries), the Commission reiterates, for the EUSAIR strategy, the need to follow the principles expressed in the Communication n. 713/2012 ('A maritime strategy for the Adriatic and Ionian Seas').

Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions concerning the governance of macro-regional strategies - 20.05.2014 – COM (2014) 284 - Final.

The European Commission, in its Report of 20.05.2014, notes that *«The Adriatic-Ionian Council, at foreign minister level, is a key driver for the forthcoming Adriatic-Ionian Strategy»*. The A.I. Coucil, moreover, is indicated as one of the "good practicese" of the strategy. The report also highlights the difficulties existing in the relationships between the Ministries of the individual countries involved:

«However ministerial meetings are not yet sufficiently systematic, or concrete, to give clear strategic leadership. Potential gaps between ministerial declarations and results need to be closed. When decisions are taken, they should be followed by concerted action. Consideration should be given to whether some ministerial meetings should become more regular, in order to further implementation on the ground». In the final recommendations, the Commission suggests to enhance the coordination between the Ministries, to improve the circulation of the results achieved, to guarantee a greater involvement of non-EU countries as well as to use the available European funds.

Communication concerning the European Union Strategy for the Adriatic and Ionian Region - 17.06.2014 - COM (2014) 357- Final. The Communication no. 357/2014 is a fundamental point of the European Union

The Communication no. 357/2014 is a fundamental point of the European Union Strategy for the Adriatic and Ionian Region because it introduces the *"EUSAIR Action Plan"*.

Action plan Accompanying the communication concerning the European Union Strategy for the Adriatic and Ionian Region - 17.06.2014 – SWD (2014) 190 - Final.

The "Action Plan" has the aim «...to go from 'words to actions' by identifying the concrete priorities for the macro-region. Once an action or project is selected, it should be implemented by the countries and stakeholders concerned...». The Plan is composed by 6 chapters and 1 Annex ["Role of the European Investment Bank (*EIB*) in the EU Strategy for the Adriatic and Ionian Region"]. The Action Plan is completed by a Table containing "Examples of selected EIB and JASPERS projects in the Adriatic and Ionian Region and their contribution to the EUSAIR ¹³". The first four chapters are dedicated to the four EUSAIR's pillars¹⁴; the fifth chapther deals with the use of the EU funds to improve the strategy and the sixth chapter is about "Monitoring, Reporting and Evaluation". In the last chapter is reported as follows:

«While the Action Plan should ideally remain relatively stable for a certain period of time, new issues may emerge along the way and priorities may evolve, requiring actions and projects and their associated targets to be updated, transformed or replaced. In other words, the Action Plan will be "rolling", and will retain a certain flexibility».

Supportive Analytical Document Accompanying the communication concerning the European Union Strategy for the Adriatic and Ionian Region - 17.06.2014 - SWD (2014) 191final

The document summarizes the objectives and peculiarities of the Strategy, also highlightingtheproblems and critical issues that emerged during the stakeholders' hearing ("EUSAIR Workshop" held in Athens on 07 February 2014). The conclusions indicate the guidelines to be followed by the Strategy:

¹³ The EIB Group is composed by two parts: the European Investment Bank (EIB) and the European Investment Fund (EIF). EIB usually supports and finances projects in the following areas: a) Innovation and skills; b) Small businesses; c) Infrastructure; d) Climate and environment. An important role is played by Joint Assistance to Support Projects in European Regions (JASPERS): it is a technical assistance partnership between the EIB and the European Commission and is an important instrument of the EU Cohesion Policy. JASPER helps beneficiaries shape high-quality projects by offering three types of support: project preparation, capacity building and independent quality review. JASPER assistance usually covers five areas: roads, rail, air and maritime, water and wastewater, smart development, energy and solid waste.
¹⁴ For the EUSAIR's Pillars please refers to Chapter 2) of this Report

«While the Strategy will be accompanied by a rolling Action Plan that identifies concrete topics and projects in relation to which cooperation should be intensified.

As outlined, the design of the EU Strategy for the Adriatic-Ionian Region will be based on the following elements: An extensive consultation process: From the EUSBSR and EUSDR it is clear that the political acceptance of the actions proposed was high, thanks to a wide and open consultation process. Therefore, the Commission used the same tools and the same approach when preparing the macro-regional strategy for the Adriatic- Ionian Region, i.e. meetings with specifically-appointed National Contact Points, organising extensive stakeholder consultation, including on-line public consultation and interservice coordination within Commission services:

A Communication and Action Plan: The structure and organisation of both documents will reflect lessons learnt in the preparation and implementation of previous macroregional strategies as well as main messages from the consultation process:

A governance and implementation framework for cooperation: The Strategy will also take into account main principles and recommendations contained in the Report from the European Commission on the governance of macroregional strategies. The existing High-Level Group on macro regional strategies will embrace also the new Adriatic-Ionian Strategy, taking into account the specificities of this area, in particular the large participation of non-EU pre-accession countries. Coordination of each pillar will be done by Pillar Coordinators, (an EU and a non-EU participating country) and the Commission will facilitate the process, coordinate the work and evaluate progress.

Alignment of existing EU, national, regional and local public as well as private funds.

For each of these elements, experience gained from

preparing and implementing the EU Strategy for the Baltic Sea Region and the EU Strategy for the Danube Region, as well as from sea-basin strategies, has been used as a source of inspiration, specific to the Adriatic-Ionian Region».

Council conclusions on the European Union Strategy for the Adriatic and Ionian Region (EUSAIR), General Affairs Council meeting, Brussels, 29 September 2014. The document is a synthesis of the Brussels Meeting, during which it was recognized, also with reference to the "EUROPE 2020 Strategy", a particular importance to the EUSAIR strategy in the following terms:

«... (G) ACKNOWLEDGES that the Strategy benefits from: the long experience of the intergovernmental Adriatic-Ionian Initiative which created strong links between the participating countries, and generated regional co-operation between cities, chambers of commerce, universities and national parliaments:

the Maritime Strategy for the Adriatic and Ionian Seas adopted by the Commission on 30 November 2012, which addresses, inter alia, Blue Growth opportunities for the sea basin:

coincidental timing of its launch and the start of the 2014-2020 programming period, which helps mobilising relevant policies and programmes in support of the Strategy; the lessons learned from the existing macro-regional strategies, and in particular the need to focus on a limited number of challenges and opportunities, to strengthen institutional and administrative capacity based on existing structures, and to secure ownership, commitment and leadership from participating countries. (H) APPRECIATES that the Strategy, while concentrating on four pillars and focusing on the topics with the highest macro-regional relevance will be able to address major challenges of the Adriatic and Ionian Region, such as socioeconomic disparities, significant transport infrastructure deficits, a fragmented energy market, intense pressure on

water, land and biodiversity, natural and man-made hazards and risks entailed notably by climate change, administrative and institutional inadequacies:

(I) RECOGNISES that actions in the areas of Blue Growth would bring about promotion of sustainable economic development and jobs and business opportunities, UNDERLINES the importance of improving transport infrastructure and intermodal connectivity of core and comprehensive network in the Region as well as of improving energy infrastructure, RECOGNISES the need to address environmental quality in the Region and to support coordinated efforts of the participating countries to this end which are beneficial for the Adriatic and Ionian Region and in line with the EU acquis and Barcelona Convention, RECOGNISES that the potential of the Adriatic and Ionian Region in tourism as the fastest growing economy sector has not been fully exploited and would benefit from coordinated activities that would enhance future tourism development based on the principles of the green economy, worldwide marketing of the Adriatic-Ionian "brand" of tourism products and services, all-year extension of tourism season, cultural and natural heritage enhancement, accessibility, with additional endeavour to include local communities in tourism activities...».

The European Council, therefore, concludes by inviting the Commission to make every effort for the best success of the Strategy and asking the countries involved to implement the cooperation and the participation for a better involvement of all the countries (UE and extra UE) involved in the European Union Strategy for the Adriatic and Ionian Region.

Endorsement of the European Union Strategy for the Adriatic and Ionian Region (EUSAIR), European Council, Brussels, 23-24 October 2014.

The document remarks the Council conclusions of 29.09.2019 as follows:

«25. The European Council endorsed the European Union Strategy for the Adriatic and Ionian Region (EUSAIR) and called on all relevant actors to implement it without delay, as outlined in the Council conclusions of 29 September 2014».

Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the implementation of EU macro-regional strategies - 16.12.2016 - COM(2016) 805 -Final. The Report of 16.12.2016 «...gives an assessment of the strategies' state of implementation and takes stock of the main results and gives examples of good practice...». Furthermore, «it draws lessons from the experience gained so far and presents a number of recommendations on possible further developments, also in the light of the future cohesion policy».

Commission staff working document - Accompanying the 'Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the implementation of EU macro-regional strategies' - 16.12.2016 -SWD(2016) 443. Finally, the Staff working document supports the Report of 16.12.2016.

The EUSAIR's pillars:

- a) Sustainable Tourism,
- b) Blue growth,
- c) Environmental Quality,
- d) Connecting the region.

According to the Supportive Analytical Document SWD(2014) – 191 Final, the principal EUSAIR's aim «is to promote sustainable economic and social prosperity of the Adriatic-Ionian Region through growth and jobs creation, by improving its attractiveness, competitiveness and connectivity while at the same time preserving the environment and ensuring healthy and balanced marine and coastal ecosystems. It will also contribute to EU integration of participating Western Balkans preaccession countries». The whole Strategy is composed by four pillars and each pillar is coordinated by an EU Country and a non-EU Country: Greece and Montenegro (Pillar 1 – Blue Growth: focused on sustainable economic growth and jobs); Italy and Serbia (Pillar 2 - Connecting the Region: focused on maritime transport, intermodal connections and energy network); Slovenia and Bosnia and Herzegovina (Pillar 3 - Environmental Quality, focused on preserving marine and coastal ecosystems); Croatia and Albania (Pillar 4 – Sustainable Tourism, focused on diversifying tourism offer and promoting sustainable and responsible tourism management).



The first pillar (Blue Growth) has the general objective to innovate maritime and marine growth in the Adriatic-Ionian Region by promoting sustainable economic growth and creating jobs as well as business opportunities in the blue economy sectors.

- (1) promoting research, innovation and business opportunities in blue economy sectors, by facilitating the brain circulation between research and business communities and increasing their networking and clustering capacity;
- (2) adapting into sustainable seafood production and consumption, by developing common standards and approaches for strengthening these two sectors and providing a level playing field in the macroregion;
- (3) improving sea basin governance by enhancing administrative and institutional capacities in the area of maritime governance and services.

Three topics are developed under the First Pillar and they concern **Blue** technologies, Fisheries and Aquaculture and Maritime and marine governance and services.

According to the Action Plan, these topics are in line and support the themes ot the "Europe 2020 Strategy" about the "Blue Growth¹⁵".

With specific regard to Blue Technologies, it has been detected lack of cluster companies, research centres and public agencies; outdated technologies, lack of planning and financial funds (especially in non-EU Countries).

It has therefore been observed that the Adriatic-Ionian region needs to implement them because the lack of clusters doesn't allow, for exemple, "to fully exploit the advantages that could be gained from better cooperation between

research centres and the public and private sectors".

Solving this gap would have a positive impact in other key sectors for the macroregion such as shipbuilding, boating industry and logistics.

With specific regard to **Blue Technologies**, it has been detected lack of cluster companies, research centres and public agencies; outdated technologies, lack of planning and financial funds (especially in non-EU Countries).

It has therefore been observed that the Adriatic-Ionian region needs to implement them because the lack of clusters doesn't allow, for exemple, "to fully exploit the advantages that could be gained from better cooperation between research centres and the public and private sectors".

To overcome that critical point, the Action Plan identifies the activities to enhance the topic as follows:



¹⁵ The Action Plan specifies that the "Blue Growth is the overarching objective of an EU initiative published in 2012. It is the maritime dimension of Europe 2020. The concept is connected to the Europe 2020 objectives of smart, sustainable and inclusive growth and aims at unlocking the untapped potential of Europe's seas and coastal areas. The Blue Growth Strategy seeks to foster growth and job creation by capitalising upon the so-called blue economy. Its main focus is on blue energy, aquaculture, maritime, coastal and cruise tourism, marine mineral resources and blue biotechnology'



Fisheries and Aquaculture are important sectors for the developement of the Adriatic and Ionian region (especially on islands and in remote regions).

However, these activities suffer from some critical points: depletion of marine resources, global market and competitiveness and small fishing fleets weaken the fisheries, while limited access to space and licensing, industry fragmentation, limited access to seed capital or loans for innovation and bureaucracy harms aquacolture.

About *fisheries* the topic aims at "long-term sustainable and responsible fisheries and economically sustainable and environmentally friendly aquaculture" to implement the Common Fischeries Policy (CFP), to ensure better traceability and marketing of products, to create multiannual plans for strengthening sustainable management of fisheries and collecting data, to control and monitoring the fishing activities.

In the Adriatic-Ionian region fisheries activities are predominantly small-scale¹⁶ and suffer the global competitiveness especially considering the current overexploitation of fish stocks¹⁷.

It is necessary that the EUSAIR's Countries cooperate to devolope a virtuous process of increasing the competitiviness of the coastal communities: this aim would also benefit sustainable tourism.

Aquaculture is a key sector not only for the EUSAIR's countries (especially for Italy, Croatia and Greece where it is well developed) but also for the whole EU because it allows to reduce the european dependency on imports and to decrease the pressure on fish wild stocks.

However, this activity needs to be strengthened through proper planning and use of maritime space that also consider the needs of tourism as well as the vessel traffic.

Specifically, the EUSAIR Action Plan identifies the following activities to strenghten the "Fisheries and Aquacolture" topic:

- sustainable management of fisheries (multiannual plans);
- EU compliance and common standards and practices;
- Output: A starting of the s
- Research and Development platform for seafood;
- O developing skills (promoting and strengthening networkf of academies) and training institutes; safety at work);
- marketing of seafood products.

Some objectives for the development of aquaculture, according to the Action Plan, could be the adoption of multiannual fisheries management plans for the stocks adopted and implemented at Sea basin level and to foresee a number of joint marketing initiatives aiming at establishing an Adriatic-Ionian brand for seafood products.

Therefore, the topic has the following aims:

- () to enhance the governance of maritime space (implementation of coordinated planning);
- (\rightarrow) to harmonise standards and regulation;
- (\rightarrow) to share data and knowledges;
- (\rightarrow) to boost maritime skills;
- → to promote citizens and business awareness regarding blue economy, new technologies, fisheries and aquaculture.

According to the Action Plan "Concrete results are mainly to be found in the field of increased networking on improving EU compliance, data and information sharing and development of common standards. Other results will pertain to training to improve skills and capacities and to awareness-raising. Accordingly, the number of newly established networks on monitoring and maritime spatial planning or integrated coastal management, as well as the number of trainings provided could serve as starting point for establishing result indicators. These results would prepare the ground for improved cooperation structures, joint databases or monitoring systems and implementation of joint plans. Possible points of departure for quantifiable result indicators may thus be a common MSP and ICM plans along the Adriatic-Ionian Sea basin and coastlines, the number of joint databases or monitoring systems put in place".

In this way the targets of the topic can be summarized as follows: creation of a shared system of major macro-regional data bases (i.e. Adriatic-Ionian Cloud); 100% of the water under national jurisdiction and 100% of coast lines covered by Maritime Spatial Planning and Integrated Coastal Management and their implementing mechanisms fully in place.

The third topic, Maritime and marine governance and services, starts from the assumption that EUSAIR's countries have different administrative and political structure as well as government and governance systems.

About 80% of commercial fishing vessels are below 15 meters long

According to the Action Plan out of approx. 450 fish species in the sea basin, 120 are threatened by overexploitation.



Links to the other EUSAIR's Pillars:

Transport connections for delivery of goods (seafood) \rightarrow Pillar 2: Connecting the region; Sustainable use of marine and maritime resources \Rightarrow Pillar 3: Environmental quality; Cooperation between fisheries and tourism activities \Rightarrow Pillar 4: Sustainable tourism.

The Second Pillar "Connecting the **Region**" has the main objective to improve the connections between the EUSAIR countries with the rest of EU in terms of transport and energy networks. There are many disparities between the countries in economic and infrastructural terms, so it is necessary creating better solution and investments for transport and energy connections that could have benefits for economic ad social development as well as for the environment (air emission cut).

A well-developed intermodal transport can have good efforts for the Region and for its connections with Central and Eastern Europe, but there is currently a lack of infrasructures as well as market regulation (e.g.: electricy prices).

The Action Plan identifies the following specific targets:

- () to strengthen maritime safety and security and develop a competitive regional intermodal port system;
- (-) to develop reliable transport networks and intermodalconnections with the hinterland, both for freight and passengers;
- supporting the three energy policy objectives of the EU-competitiveness, security of supply and sustainability.

To achieve these targets, the pillar will focus on three topics: *maritime transport*, intermodal connection to the hinterland, energy network.

In order to the first topic, it has been observed that the Maritime transport is the backbone of the Adriatic-Ionian region and it is a fundamental part of the economic development of the area. A major role, in this context, has been played over the years by the "Motorways of the Sea" that need modern and efficient intermodal ports.

It is important to improve the

infrastructural system (that also takes the environmental protection into account) as well as to simplify the administrative procedures and, more generally, bureaucracy.

A critical point for the Adriatic-Ionian area, moreover, concerns the traffic system that need to be strenghten. However, it should also be noted that the "North Adriatic Ports Association" (NAPA)

has made good efforts in cooperating between the Adriatic ports to compete with the Northern Europe ports¹⁸.

Ports developing is also important because it coul help the local traffic (ferries and RO-RO short-sea shipping), especially for the islands that exist in the Adriatic-Ionian region, with a positive impact on tourism.

On the other hand, it has to be considered that ports coul be a "possible gate for unlawful trades concerning drugs, weapons, counterfeited goods. Ports are also gateways for introduction of invasive alien species which can make a negative impact on other activities, like aquaculture or tourism", thus it is essential to increase levels of security and surveillance. Finally, the aim could be achieved through ports' development and cooperation (Clustering port activities/servicesthroughout the region; Improving and harmonising traffic monitoring and management; Developing ports, optimisingport interfaces, infrastructures and procedures/operations). The expexted results are to double the current Adriatic-Ionian market share in container traffic reaching EU, to estabilish a single system for maritime traffic surveillance through a unique window and common data exchange, to increase the traffic of clean Ro-Ro, ferries, short-sea shipping and cruise ships and yachts by 20%.

Another significant topic is the intermodal connections to the hinterland, not only in terms of technical aspects and infrastructure, but also in terms of organisational issues, meeting overall transport demand and seasonal/daily traffic peaks, spatial planning, life-styles, innovations, etc.

Considerable investment has been made in **road development** in the Western Balkans area in recent years, although further investment is needed for the modernisation and upgrading of some 1200 km. A major effort is also needed to increase sustainable transport.

It is also necessary a huge effort to increase the railway services and the air transport system in terms of competitiviness, investments and connectivity.

EUSAIR has identified the following actions to reach the aim:

- development of the Western Balkans network;
- () improvement of the accesibility of the coastal areas andislands; development of "Motorways of the sea";
- \bigcirc railway reform;
- → improvement of air transport and cross-boarder facilitation;
- crossings.

() the expected results are the sharing of coastal road traffic planning, the doubling of rail freight traffic in the region, a 50% reduction in waiting times for border

¹⁸ According to the Action Plan: "The (NAPA) partners agreed, in particular: (a) to establish a network of port community systems capable of integrating all members of the transport community through internet; (b) to exchange data on the shipping lines and vessels operating between sea ports and harbours in order to achieve coordination and integration; and (c) to promote the concept of "Single Window" with the aim of reducing transaction costs and operation turnaround time"



The last topic *Energy networks* is closely related to energy markets. The European Union, through the opening of the common market, has contributed both in terms of competitiveness and security of supply of electricity¹⁹.

However, regarding the Adriatic-Ionian region, the integration of the electricity market is a goal which should be achieved by 2020.

It has also been observed that the gas sector needs to improve the interconnections beetween national

markets and to gain access to new external sources, thus it is necessary to strenghten the infrastructural system (gas pipelines)²⁰.

The actions drawn by the EU Commission to reach the goal are the improvement of electricity interconnections, the enhancement of gas pipelines, the establishment of a well functioning electricity market and the reduction of barriers for cross-border investments.

Links to the other EUSAIR's Pillars:

As reported in the Action Plan: «Pillar 2 is an obvious prerequisite for the three other pillars. For example: harmonisation of maritime traffic monitoring and information system will help development of fisheries and aquaculture; intermodal transports will reduce environmental impact; better transport connections are a must for tourism development, particularly in insular and remote areas».

The third pillar "Environmental Quality" is connected to the protection of marine, coastal and terrestrial ecosystem of the Adriatic-Ionian region.

The specific objectives of the pillar are to ensure a good environmental and ecological status of the marine and coastal environment by 2020 in line with the relevant EU acquis and the ecosystem approach of the Barcelona Convention; to contribute to the goal of the EU Biodiversity Strategy to halt the loss of biodiversity and the degradation of ecosystem services in the EU by 2020 and restore them in so far as feasible, by addressing threats to marine and terrestrial biodiversity; to improve waste management by reducing waste flows to the sea and to reduce nutrient flows and other pollutants to the rivers and the sea.

The environmental quality pillar identifies two topics to achieve the general objective. The first topic is "The marine environment" and the second one is "Transnational terrestrial habitats and biodiversity".

In order to the *Marine environment*, it has been observed that the Adriatic and Ionian seas are rich in biodiversity but they are also threated by overfishing, habitat degradation and incidental fish catches; uncontrolled and illegal coastal development; pollution of the seas.

EUSAIR has the aims to increase marine knowledge (Maritime Spatial Planning and Integrated Coastal Management), to enhance the network of Marine Protected

The **Transnational terrestrial habitats** and biodiversity has the aim to preserve the environment by considering that climate change will have a strong impact on the Adriatic-Ionian Region.

The Action Plan provides for the following actions to be launched:

- (1) development of joint management plans for cross-border habitats and ecosystems ("NATURA 2000" network);
- 2 joint population level management plans for large carnivores and awarenessraising activities;
- (3) harmonisation and enforcement of national laws with EU legislation;
- 4 protection and restoration of coastal wetland areas and karst fields;
- measures).

The third pillar has to face many critical points. Regarding the coastal and marine biodiversity threatening, the Supportive Analitycal Document SWD (2014) 191 - Final notes: «Increased human use of the coastal and marine space, however, in particular for fishing, maritime transport, tourism and construction, has intensified pressure on coastal and marine ecosystems, often resulting in destruction of breeding grounds and habitats. Aquaculture is a rapidly growing industry which is not regulated in all countries so as to ensure environmentally-friendly practices. Illegal and uncontrolled construction, sealing soils, is a widespread phenomenon along most shorelines, with demand from tourism for additional construction further compounding the problem». Huge problems also arise from the intensive maritime transport, especially in the Adriatic Sea, that causes high-level pollution and from the climate change that could have negative effects on the Region's biodiversity.

Links to the other EUSAIR's Pillars:

Good environment quality has a better impact on the Blue growth (Pillar 1) and can contribute to sustainable tourism (Pillar 4). In addition, a better attention to environment quality could support low-carbon developments and help limit the impact of transport and energy programmes and projects (Pillar 3).

Areas, to implement a life cycle approach to marine litter and support cleaningup programmes, to exchange good practices, to reduce the pollution.

(5) awareness-raising activities on implementation and financial aspects of environmentally-friendly farming practices (e.g. organic farming, agrienvironmental

¹⁹ It is useful to mention the creation of the European Network of Transmission System Operators for Electricity (ENTSO-E), established and given legal mandates by the EU's Third Legislative Package for the Internal Energy Market in 2009, which aims at further liberalising the gas and electricity markets in the EU.

²⁰ The Action Plan refers about the TAP (Trans Adriatic Pipeline) project that is currently in progress and the IAP (Ionian-Adriatic Pipeline) project that is still under development. More infos: about TAP https w.tap-ag.com; about IAP infrastructure/PLIMA/Gas16.html)



The fourth pillar "Sustainable Tourism", as reported in the Action Plan, «focuses on developing the sustainable and responsible tourism potential of the Adriatic-Ionian Region, through innovative and quality tourism products and services. It also aims at promoting responsible tourism behaviour on the part of all stakeholders (wider public, local, regional and national private and public actors, tourists/visitors) across the Region. Facilitating the socio-economic removing perspectives, bureaucratic obstacles, creating business opportunities and enhancing the competitiveness of SMEs are essential for the development of tourism».

Tourism is an important factor for the Adriatic and Ionian region development. However, it needs to be geared towards sustainability and responsibility policies. To achieve that objective, it is important to diversify the tourism offer in terms of products and services and so EUSAIR has identified the following actions to reach the pillar: brand-building of the Adriatic Ionian tourist products/services; initiative to improve quality for sustainable tourism offer; diversification of the cruise and nautical sectors and enhancement of the yachting sector; sustainable tourism R&D platform on new products and services; sustainable and thematic tourist routes; fostering Adriatic-Ionian cultural heritage; improving accessibility for Adriatic-Ionian tourism products and services; upgrade of Adriatic-Ionian tourism products.

At the same time, tourism has to face the challenge of sustainability and responsibility because the so called "mass-tourism" has negative effects on the coastal, marine and hinterland development.

It's thus necessary to increase a sustainable and responsible approach to enhance the access to finance for new innovative tourism start-ups, to expand the tourist season to all year-round, to improve training and skills, and to cooperate for facilitating tourist circulation.

The expected results for the fourth pillar are the creation of five new macro-regional routes and at least the 50% increasing in tourist arrivals from countries outside the Adriatic-Ionian region as well as in tourism arrivals during the off-season period.

Links to the other EUSAIR's Pillars:

A better sustainable tourism needs well-developed intermodal network (Pillar 2). Also the Blue growth (Pillar 1) and the Environmental quality (Pillar 3) «play an evident role in ensuring the integrated sustainability sought through the 'Sustainable Tourism' pillar».

FUNDING THE MITIGATION OF COASTAL 6 **EROSION**

The objective of the next paragraphs is to support the municipalities and operators in fund raising and access to EIB/EIF/EASME programmes giving them an updated framework of the current opportunities to finance interventions for the mitigation of coastal erosion. It would be useful that coastal cities, using these resources and through cooperation instruments, proceed with planning to safeguard and protect the coast. All these elements, together with technical solutions aimed at combating coastal erosion, must be brought together in a single common strategy that can count on the financial contribution of the economic structures of the Union.

EIB, EIF AND EASME 6.1

The European Investment Bank (EIB)²¹ was established in 1958 with the signing of the Treaty of Rome and its headquarters were located in Brussels until they were transferred to Luxembourg in 1968.

The bodies responsible for taking decisions are:

- () The Board of Governors, responsible for establishing the general credit policy, which usually consists of the Finance Ministersof all EU countries;
- operations. The Board nominates a President and consists of twenty-eight members appointedby the EU countries and the European Commission (only one member);
- () The Management Committee, which is the bank's executive body and manages its day-to-day business.

The European Investment Bank is owned by the EU countries, which are shareholders in it.

The Board of Directors, which is responsible for approving acquisition and lending

²¹ https://www.eib.org/en/index.htm



The Audit Committee is responsible for ensuring the Bank's transactions are carried out correctly.

Decisions taken by the Management are implemented by the Bank's departments. By borrowing on the capital markets, the Bank provides loans on favourable terms for projects that support EU objectives.

In around 90% of cases, loans finance projects within the EU, while outside the EU the Bank supports the Union's development and cooperation policies worldwide.

The European Investment Bank's loans are granted to companies operating in the public and private sectors and, in particular, at large public sector projects.

Loans are granted on concessional terms, but do not cover more than 50% of the cost of a project; this is intended to encourage the participation of other lenders, private individuals and other public financial institutions.

The Bank provides:

- → loans, which account for about 90% of its total financial commitments. The Bank lends to clients of all sizes to support growth and employment, often helping to attract other investors:
- ⊖ blending, so that clients can use both EIB financing and other investments together;
- \bigcirc advice and technical assistance to maximise the return on funds.

Loans over EUR 25 million are disbursed directly by the Bank, while smaller loans are made through financial institutions that provide funds to applicants.

The Bank focuses its activities in four areas:

- (\rightarrow) climate and environment;
- \bigcirc innovation and skills;
- (\rightarrow) small businesses;
- \bigcirc infrastructures.

These projects must be with high technical, environmental and social standards. The Bank cooperates with other EU institutions and, in particular, with the European Commission, the European Parliament and the Council of the EU. The EIB²¹ is the main shareholder of the European Investment Fund (EIF)²², established

22 https://www.eif.org/

in 1994, which is specialised in finance for small businesses and mid-caps. We are therefore talking about the EIB Group.

The EIF's products include:

- → venture capital and microfinance for SMEs, in particular for new and innovative enterprises;
- guarantees for financial institutions, covering loans to SMEs;
- help to EU and accession countries to develop their own risk capital markets.

The Executive Agency for SMEs (EASME)²³ was created by the European Commission to manage autonomously some EU programmes in the fields of SME support and innovation, environment, climate action, energy and maritime affairs. This Agency is employed to turn EU policies into concrete actions. In this perspective, this Executive Agency of the European Commission manages important parts of COSME, LIFE, Horizon 2020 and EMFF.

6.2 FINANCIAL INSTRUMENTS IN SUPPORT OF THE **BLUE ECONOMY**

For the implementation of instruments within the blue economy, the Region and These Funds are intended to create jobs local authorities can make use of some and promote a healthy and sustainable financial instruments, in particular, the economy and environment. The EMFF is the European Maritime and European Structural and Investment Funds (EIF funds)²⁴. These funds are Fisheries Fund. It supports fishermen in managed by the European Commission the transition to sustainable fisheries, and the EU countries, through partnership helps coastal communities to diversify agreements prepared by each State their economies, finances projects that in collaboration with the European create new jobs and improve the quality Commission where it is indicated how the of life in Europe's coastal regions. funds will be used. The ERDF, on the other hand, is the

The partnership agreements result in a series of investment programmes aimed at distributing funding to different

Other shareholders in the EIF are the European Commission and financial institutions throughout Europe.

regions and projects.

European Regional Development Fund which can be used to finance projects related to the blue economy under

https://ec.europa.eu/easme/en/section/about-easme. tps://ec.europa.eu/info/funding-tenders/funding-opportunities/funding-program and-investment-funds it



thematic objective no. 5 "promoting climate change adaptation and risk prevention and management" and no. 6 "preserving and protecting the environment and promoting resource efficiency".

In these cases, priority is given to investments leading to an improvement of the urban coastal environment, involving low-carbon intermodal transport systems and the reduction of air and noise pollution in port areas, as well as the regeneration of port cities, the protection of marine biodiversity and the promotion of sustainable infrastructure and services.

This fund may also be used under Thematic Objective 2 "Improving access to, use and quality of information and communication technologies": here, priority will be given to investments in the digital economy, especially those related to data on water quality and tourism flows.

The EAFRD is the European Agricultural Fund for Rural Development, which provides for a series of maritime investments to be financed by the "LEADER" measure.

Finally, the ESF is the European Social Fund which can be used to finance inter-sectoral projects related to the blue economy.

Jasper

Currently, public administrations are facing new challenges for developing cities and their infrastructural systems. The need to promote sustainable policies for a correct growth collides with the lack of financial resources as well as the absence of competent staff.

Thus, an important role in funding is played by "Joint Assistance to Support Projects in European Regions" (JASPER) that is a technical assistance partnership between the EIB and the European Commission and an important instrument of the EU Cohesion Policy.

JASPER guarantees three kinds of support (project preparation, capacity building and independent quality review) and focuses on five sectors: roads, rail, air and maritime, water and wastewater, smart development energy and solid waste. In detail, JASPER informs the EU public administrations as well as the so-called "Accession countries" how to benefit from European financial resources (where available).

According to the JASPER official website "Since the start of operations in 2006 and until 31/08/2019, JASPER has completed 1631 assignments. As at 31/12/2018, a total of 760 JASPER-assisted applications for funding for major projects had been approved by the European Commission, for a total investment cost of around EUR 140 billion, of which EU grants amounted to EUR 77 billion."

Existing Funds to improve the regional strategies

The Regulation (EU) No. 1303/2013 contains a specific section for the funds (Title IV - Articles 37 to 46), according to which "The ESI Funds may be used to support financial instruments under one or more programmes, including when organised through funds of funds, in order to contribute to the achievement of specific objectives set out under a priority" (Article 37).

The financial intervention plans for the period 2014-2020 are currently operational, although in the process of being finalised. The European Commission, however, has already started the programming of the period 2021-2027 with which financing the next EMFF, ERDF, ESF and EAFRD. More in detail, Regulation (EU) No. 966/2012 contains the financial rules applicable to the general budget of the Union (repealing Council Regulation - EC, Euratom - No. 1605/2002) and defines the EU financial instruments that also feed the European Funds as "measures of financial support provided on a complementary basis from the budget in order to address one or more specific policy objectives of the Union. Such instruments may take the form of equity or quasi-equity investments, loans or guarantees, or other risksharing instruments, and may, where appropriate, be combined with grants" (article 2 - P); The Apulia Region, in line with EU regulations, has given a boost to its programming in the maritime and fisheries, regional development, social and agricultural sectors by adopting several public notices aimed at distributing the financial resources made available by the EU Commission.

EMFF

The EMFF is one of the five European Structural and Investment (ESI) Funds. This is the fund for the EU's maritime and fisheries policies for 2014-2020: it helps fishermen in the transition to sustainable fishing, it supports coastal communities in diversifying their economies, it finances projects that create new jobs and improve quality of life along European coasts,

The Local Authorities are interested in the following measures:

() Measure 1.26. The measure 1.26 aims to promote innovation in the fisheries sector for the operation under direction. More information: http://feamp.regione.puglia.it/documents/2651391/19034204/ DD+1.26+su+BURP.pdf/15a9dba2-0d9d-4a97-8db0-0e5782554865

it supports sustainable aquaculture developments and it makes it easier for applicants to access financing.

For the purpose of implementing the priorities to be co-financed by the Fund, on the basis of Article 17 of EU Reg. No 508/2014, Italy has drawn up the **Operational National Programme EMFF** 2014-2020 (hereinafter EMFF OP).

by supporting projects aimed at developing or introducing new or substantially improved products and equipment, new or improved processes and techniques, and new or improved management and organisational systems, including at processing and marketing level. The implementing provisions of the measure admit public administrations to co-financing, both for the operation under ownership and



→ Measure 1.43. This measure concerns – "Ports, landing places, auction halls and fishing shelters" of the OP EMFF 2014/2020. The Apulia Region has launched an exploratory call for interest for the implementation of immediate shipbuilding projects by Public Bodies.

More information: http://feamp.regione.puglia.it/misura-1.43.

G Measure 4.63. This measure concerns the "Implementation of participatory local development strategies".

The Alto Salento LAG published (BURP n. 110 of 26.9.19) a public notice for initiatives aimed at restoring coastal and marine natural habitats subject to strong pressure from seaside tourism, or affected by degradation due to the presence of residential or industrial settlements, through the rationalization and upgrading of accesses to the coast able to preserve and make known the natural and cultural resources (towers, lookouts, ancient aquaculture facilities, etc..) in the coastal landscapes of Alto Salento.

More information: http://feamp.regione.puglia.it/misura-4.63.

The Terra D'Arneo LAG published (BURP n. 101 of 5-9-2019) a public notice for the submission and selection of applications for support, aimed at enriching and enhancing the supply of locally processed fish and agricultural products, encouraging organizational and process innovation, including through the formation of networks to promote services that can help to integrate or diversify fisheries-related activities. More precisely, the intervention foresees the creation of a small basic infrastructure aimed both at the improvement of the fishery markets, of the areas destined to the marketing of ichthyic products, as well as of the structures dedicated to the valorisation of the maritime heritage, and at the creation and adaptation of a widespread system of ports, landing points and fishing shelters, including the structures for the collection of waste and marine waste.

More information: http://feamp.regione.puglia.it/misura-4.63.

The South East Barese LAG published (BURP n. 78 of 11.7.2019) a public notice "Local markets of fishery products" for the presentation and selection of applications for support from the resources provided by the LAG, aimed at promoting the implementation - by the Public Administrations of the coastal area of the LAG - of infrastructural interventions in public areas or spaces to be used for the direct sale of local fish products.

More information: http://feamp.regione.puglia.it/misura-4.63.

The Valle d'Itria LAG published (BURP n. 143 of 8.11.2018) a public notice "Local markets of fishery products" for the presentation and selection of applications for support aimed at promoting the realization also - by public bodies in the coastal area of the LAG

 \bigcirc of infrastructural interventions in public areas or spaces to be used for direct sales of local fish products. More information: http://feamp.regione.puglia.it/misura-4.63

EAFRD

The EAFRD Funds, through the Leader measure, can be used to finance interventions affecting coastal areas. There are still open calls for proposals.

The following are the main ones.

(-) The Alto Salento LAG published (BURP n. 148 of 19.12.2019) a public notice for the Action 6 "Social innovation for landscape". Normanni, Villa Castelli.

This is an open call for proposals, so applications may be submitted until the full use of the financial resources allocated under the call for proposals. More information: http://www.regione.puglia.it/documents/10192/37907702/ Bollettino+numero+148+-+Ordinario+-+anno+2019/6c024b08-74dd-4965-94f5eb6540b56c14; jsessionid=821E27D9BFDDABEACFDF94BDD8336499.

- The Gargano LAG published (BURP n. 65 of 13.6.19) the public notice "Meeting paths" insist on at least two neighbouring municipalities and be built in continuity. f9461a707dc8.
- (>) The Capo di Leuca LAG published (BURP no. 137 of 28.11.2019) the public notice

"Realization of a social incubator on the theme of landscape" in the framework of

The intervention concerns only areas related to the Local Action Plan of the LAG Alto Salento 2020 and, more precisely, the interventions must fall within the Municipalities of: Brindisi, Carovigno, Ceglie Messapica, Ostuni, San Michele Salentino, San Vito dei

". The support for the adaptation and recovery of the network of paths built and existing, as well as the construction of light structures for reception and information is granted to partnerships of municipalities in the LAG Gargano area, consisting of at least two local administrations. The paths concerned by the interventions must

More information: http://www.regione.puglia.it/documents/10192/37907702/ Bollettino+numero+65+-+Ordinario+-+anno+2019/d919a90b-3459-4a72-bd73-

for the "Recovery and enhancement of tangible and intangible heritage", aimed at supporting investments aimed at enhancing the cultural and artistic heritage of urban centres and countryside. Therefore, initiatives for the recovery and functionalisation of properties and assets of artistic, historical and archaeological interest, linked



to the cultural tradition of the area, will have to be carried out in order to create small museums, theatres, archives, exhibitions, centres of aggregation and social integration, documentation and exhibition centres dedicated to traditions, customs and religious sentiment.

The notice is addressed to Municipal Administrations in single form falling in the territory of the LAG "Capo di Leuca", namely Alessano, Alliste, Casarano, Castrignano del Capo, Corsano, Gagliano del Capo, Matino, Melissano, Miggiano, Montesano Salentino, Morciano di Leuca, Patù, Presicce-Acquarica, Racale, Ruffano, Salve, Specchia, Taurisano, Taviano, Tiggiano, Tricase and Ugento.

This is an open Call for Proposals, so applications can be submitted until the full use of the financial resources allocated under the call for proposals.

More information: http://www.regione.puglia.it/documents/10192/37907702/ Bollettino+numero+137+-+Ordinario+-+anno+2019/23ca8e9e-2133-4e92-a8ce-8b4a6bab46d5

→ The Capo di Leuca LAG published a public call for proposals (BURP No 137 of 28.11.19) for the submission of applications for support under the LAG's LAG's 'Territory usability' intervention.

The intervention proposes an innovative way to get to know the numerous resources present in the territory, to discover cultural heritage, to visit historical centres and local companies. The call for proposals supports investments aimed at the purchase of small eco-sustainable means of locomotion.

Beneficiaries are exclusively the single municipalities in the territory of the LAG "Capo di Leuca".

This is an open Call for Proposals, so applications can be submitted until the full use of the financial resources allocated under the call for proposals.

More informations: http://www.regione.puglia.it/documents/10192/37907702/ Bollettino+numero+137+-+Ordinario+-+anno+2019/23ca8e9e-2133-4e92-a8ce-8b4a6bab46d5

The Capo di Leuca LAG published (BURP n. 137 of 28.11.2019) a public call for applications for support under the LAG's LAG's 'Small scale infrastructure for quality of life and tourism' intervention.

The call for proposals supports investments aimed at improving the quality of life through the enhancement of the specific features of the municipalities covered by the LAG "Capo di Leuca".

The intervention should enhance the aspects that characterize a certain part of the territory and should serve to bring together history and culture, including through artistic forms and innovative tools.

The call is addressed exclusively to the Municipal Administrations in a single form indicated above.

http://www.regione.puglia.it/documents/10192/37907702/ Bollettino+numero+137+-+Ordinario+-+anno+2019/23ca8e9e-2133-4e92-a8ce-8b4a6bab46d5

ERDF and **ESF**

The Apulia Region has collected the Social Funds (ESF) and the Regional Development Funds (ERDF) within the "Regional Operational Programme" (so called "POR Puglia")²⁵. The POR finance and support the initiatives aimed at social, occupational, entrepreneurial, cultural, technological, scientific, environmental and infrastructural development, with particular attention to the social inclusion of all citizens.

The Apulia Region, in line with the previous regional programming 2007-2013 and developing POR 2014-2020, has identified three macro-areas of intervention aligned with the objectives of "Europe 2020":

- () policies for research and innovation aimed at developing programmes and competitiveness also with a view to internationalisation;
- context policies (infrastructure and environment) aimed at improving the conditions (\rightarrow) sustainable transport systems;
- (\rightarrow) policies for the labour market, social inclusion and welfare aimed at increasing the training skills.

The Apulia Region, therefore, has increased the policies to strengthen administrative capacity aimed at strengthening skills (responsibilities and organisational models), reducing bureaucratic burdens (simplification), strengthening transparency and the use of shared modes of intervention.

²⁵https://por.regione.puglia.it

interventions in the industrial field, at strengthening the regional digital system (reduction of the digital divide) and at widening the conditions for strengthening the

for sustainable urban development, energy efficiency, making the territory safe, protecting and enhancing cultural and environmental resources and promoting

supply of labour through employment incentives and widening participation in the labour market. In addition, there are specific actions aimed at reducing poverty and combating social exclusion, as well as measures to improve educational and



The 2014-2020 Strategy has also developed the themes related to the Regional Strategy for Smart Specialization ("SmartPuglia 2020" and "Digital Agenda Puglia 2020"). The total budget allocated to the POR 2014-2020 is € 7.120.958.992.

Currently, several Calls for Proposals have exhausted their effectiveness but, as far as they are of interest for the purposes of this Report, the following Public Notices are still active and addressed to local governments in Puglia:

Interventions aimed at defragmentation of land and sea habitats in the Apulian territory.

The Call has the aim to preserve and protect the environment through actions that contribute at halting the loss or reduction of biodiversity, maintaining and restoring ecosystem services (in particular for those species and priority habitats of European interest), biodiversity and soils.

The Public Call is reserved for apulian municipalities, public administrations and environmental protection bodies (managing Protected Natural Areas (according to Law No. 394/1991 and Regional Law No. 19/1997).

Total resources available: € 1.500.000 - Maximum contribution per project: € 250.000 More details: https://por.regione.puglia.it/-/deframmentazione-habitat-terrestrimarini?redirect=%2Fbandi-e-avvisi

Interventions aimed at the construction or extension and/ or adaptation of municipal waste collection centres.

The Call concerns the construction, extension or adaptation of municipal waste collection centres and it is related to the completion of the regional network of municipal waste collection centres.

It also aims to encourage the development of better models and tools to support the increase in the percentages of recycling, through activities to reorganize the collection service, as well as the prevention and reduction of waste production, in order to drastically limit the amount of waste to be sent to landfill. The Call is reserved for Apulian Municipal Administrations.

Total available resources € 16.000.000 - Maximum contribution per project: up to € 380.000.

More details: https://por.regione.puglia.it/-/interventi-centri-comunali-raccoltadifferenziata?redirect=%2Fbandi-e-avvisi.

TRITON'S POSITION PAPER 7. **ON COASTAL EROSION**

According to the Commission Staff Working Document of 16 december 2016 "The general objective of the EUSAIR is to promote sustainable economic and social prosperity in the region by improving its attractiveness, competitiveness and connectivity. The strategy is also expected to play an important role in promoting the EU integration of the Western Balkans". At the same time, it was noted that action was needed to involve as many countries as possible in the strategy with particular regard to the Western Balkan ones²⁶.

During the annual meetings²⁷ between the partners of the Strategy, the need to implement cooperation, especially at political level, was stressed in order to overcome the gaps among States and to allow the best success of the goals of the 4 (interconnected) EUSAIR pillars. The territorial continuity of the Strategy and, therefore, the possibility of aggregating all the countries of the Adriatic and Ionian coastal strip as well as the Western Balkan countries, should be one of the objectives and a new EUSAIR policy for the next period 2021-2027. In this way, one of the main objectives (interconnection of the EUSAIR's pillars) could be further implemented as there would be no continuity, for example, in the development of infrastructures as well as in the development of sustainable coastal tourism with any consequent and positive impact on blue growth and environmental policies identified by the strategy.

These results, however and as often reported at the annual EUSAIR Fora, need continued economic support²⁸.

²⁶It can be read in the Commission Staff Working Document: "Finally, the incomplete coverage of the Western Balkan region in the EUSAIR is also cause of concern. Council conclusions recently stressed the importance of the inclusiveness principle which should govern EU relations with the Western Balkan countries. They support initiatives and structures which could reinforce economic cooperation with these countries, promoting connectivity and inclusiveness within the Region and with the EU. Pragmatic ways to associate all Western Balkan countries in the work of the EUSAIR, as appropriate, should be explored". The possibility of including countries other than those initially involved in the strategy has also opened up. In fact, during the annual Forum in Catania it was accepted "the request put forward by the Government of the former Yugoslav Republic of Macedonia to become the ninth Participating Country of the Adriatic and Ionian Initiative and INVITE the Council of the European Union and the European Commission to undertake all necessary steps to include the former Yugoslav Republic of Macedonia in the EU Strategy for the Adriatic and Ionian Region". During the annual Forum in Budva, furthermore, it was accepted "the request put forward by the Government of the Republic of San Marino to become the tenth participating country of the Adriatic and Ionian Initiative and REMAIN open to consider possible forms of participation of the Republic of San Marino in the EU Strategy for the Adriatic and Ionian Region".

²⁷There have been four meetings to the date: Dubrovnik (12-13 may 2016); Ioannina (12-12 may 2017); Catania (24-25 may 2018) and Budva (7-8 may 2019).

²⁸Economic support to EUSAIR initiatives has also been stressed in the Budva Declaration of 25 May 2019 where the EUSAIR countries invited the European Commission "to consider different financial mechanisms, inter alia the European Maritime and Fisheries Fund, in the process of mainstreas selected EUSAIR priorities, given the particularly high potential of the Blue Economy in the Adriatic and Ionian region".



It is essential, for the implementation of the Strategy, the adoption of policies, especially financial and economic ones, that will support, at local level, projects and ideas linked with EUSAIR²⁹. This aspect, moreover, has always been highlighted during the annual EUSAIR Fora, which have also highlighted the role of the EUSAIR Facility Point as an important aggregator centre for achieving the objectives of the strategy.

Clearly this approach should be developed for all the pillars of the strategy which are interlinked.

A greater effort should be made in the regional policies of each of the Eusair countries through the proper use of existing European funds (EMFF, ERDF, EAFRD, ESF).

It would therefore be desirable for the Regions to include in their Public Calls "reward criteria" for projects and initiatives aimed at implementing the EUSAIR topics.

Given all of the above issues, is essential to link EUSAIR with the core of "Triton Project": coastal management and its related critical features (coastal flooding and erosion).

On this basis Triton's outcomes and suggestions can be summarized as follows.

- (1) Effective participation of all stakeholders is needed to create fair decision-making processes in integrated coastal risk management through the prevention and balancing of interests through Public-Private-Partnerships.
- (2) A cross-sectoral approach to coastal development and the involvement of all public and stakeholder views, at local, regional and national scales suggest the application of resilience principles for coastal communities, providing advices on building resilience into management strategies to help our coasts cope with climate change.

- uncertainties overall. Long-term, strategic approaches are therefore requested in coastal governance.
- (4) The application of "recognized" standards and both quantitative and qualitative indicators for coastal management suggest new management strategies, as smallscale management does not produce the best results in the long-term. In Triton project, standards KPI are assumed but an innovative approach into use.
- (5) Increase modern technologies ease the task of integrating all the complex elements of coastlines for better decision making in the long-term period.
- **(6)** The participatory and integrated coastal governance is multi-scalar and works across boundaries (research, professional, sectoral and administrative boundaries). It is a key element for coastal management, whether dealing with the sustainable use of resources and specific types of coastal zones or adapting to risks and climate change.
- 7 Further research and development of governance activities are needed around issues such as institutions, coordination mechanisms and management regimes for ICZM, and, particularly, communication activities. Coastal information, education/training, participation, public and stakeholder involvement in decision-making processes and management leads to behavioural changes in all coastal stakeholders.

In the light of the foregoing, it would be appropriate to implement EUSAIR with the following proposals that can also embrace the main themes of the "Triton Project".

(a) Development of European policies on education, training and innovation

Achieving the goals contained in the four EUSAIR pillars requires specific skills and expertise for those who intend to work in key areas of the strategy. Blue Growth, Connecting the Region, Sustainable Environmental Development and Sustainable Tourism, constitute (and they will constitute in the future) an important lever for raising the employment level.

Increasing employment is one of the objectives of the Strategy. It is therefore necessary to implement the knowledge not only from a technical point of view but also from a linguistic and relational point of view and to guarantee to those who intend to engage in the areas of EUSAIR interest. The Strategy should therefore be strengthened through supporting policies to the education, training and innovation sector that allow, on the one hand, the continuous updating of professions related to the Strategy (with particular reference to young people entering the labour market) and, on the other hand, the development of new technologies useful for the implementation of the Strategy.

(3) Coasts' future is complex, dependent on climate change and holds many

²⁹In this respect, the Commission Staff Working Document of 16 december 2016 highlighted the following: "With regards to insufficient resources allocated by national administrations to the implementation of the strategy, the EUSAIR Facility Point should provide badly needed support to Pillar Coordinators and TSGs as a whole to allow them to fulfil their tasks effectively. Bringing into full operation of what is in effect a 9-partner network will, however, not be devoid of challenges. Moreover, the approach chosen by the National Coordinators 37 risks being administratively cumbersome to apply, hence causing unnecessary delays in particular when it comes to implementing Work Package T1 (logistic support to TSG members). In any event, the Facility Point will not replace the need for the national/regional administrations to ensure adequate human and administrative resources for fulfilling their tasks as EUSAIR key implementers. In the meantime - whilst by no means fungible with the effort required from national administrations to drive the strategy forward or taking away their responsibility for doing so - over this initial period, on-going Commission input proved indispensable, both in terms of logistics and substance, to prevent the entire process from stalling. Such input, however, is neither sustainable nor even desirable. While the Commission should do the outmost to help, it cannot/should not replace the participating countries in the driving seat. The role of the Commission should remain that of a strategic coordinator – where its involvement brings a clear added value - in partnership with the participating countries and in accordance with the subsidiary principle. In this respect, the involvement of Commission line departments in the implementation of the Strategy needs to be substantially improved. More concretely, at the coordination level, the rotating Presidency should provide a strong impulsion to the strategy and effectively take its lead, in close cooperation with the National Coordinators and all members of the GB. Designation of both National Coordinators (Foreign Affairs, or equivalent, and national authority responsible for EU funds) should be completed and effective participation in GB activities should be ensured. At the implementation level, in addition to designation and attendance issues hampering decisions in TSGs , the circumstance that TSG members were faced with the, for them, often unusual - and at times uncomfortable - requirement of shifting their outlook from a purely regional/national perspective nacro-regional one tended to further slow the pace of decision-making". to a transna



All European policies aimed at creating job opportunities, for example, should support and strengthen:

- → specific study or training pathways related to EUSAIR issues both during the university and post-graduate periods (e.g.: Erasmus project, Master degree, Internship, Summer/Winter School, Workshops and on-site visits, etc...);
- () continuous cultural, social, legislative, economic and technical exchanges to enable the sharing of experiences and best practices;
- creation of workshops to develop the themes of the strategy

These objectives can also be developed and strengthened through the use of European Funds or, in any case, of specific dedicated funds made available to the EU Commission for the Strategy.

At the same time, it is necessary to take into account the technological development which, in the areas of EUSAIR intervention, can be a "key element" for the achievement of the Strategy.

It could be necessary to take into account, by way of example and in relation to the Eusair Pillars, the technological evolution:

- in terms of shipbuilding according to environmental sustainability concepts (Pillar) 1 - Blue Growth - Topic: Blue technologies) or in terms of coastal erosion prevention (Pillar 1 - Blue Growth - Topic: Maritime and marine governance and services);
- () in terms of transport and energy Pillar 2 Connecting the Region Topics: Intermodal connections to the hinterland; Energy networks) and sustainable port infrastructure (Pillar 2 - Connecting the Region - Topic: maritime transport);
- → in terms of marine biodiversity classification systems (Pillar 3 Environmental Quality - Topic: The marine environment) or the fight against marine pollution (Pillar 3 - Environmental Quality - Topic: Pollution of the sea).

Also in this context, policies would be necessary, especially by the Countries involved in the Strategy, aimed at making better use of European funds for the creation of working and research groups, in line with the EUSAIR Action Plan.

In order to implement the Strategy, therefore, it is also necessary to provide measures for the creation of innovation aggregators (e.g. incubators, districts, fablab, etc...) that could stimulate opportunities for meeting and contamination, promoting innovation processes and the creation of synergies both at cross-sectoral and transnational level.

This would be an application of the parts of the Strategy that aim to implement:

- R&D&I platforms on green sea mobility, deep sea resources, biosecurity and biotechnologies;
- in macro-regional cluster development (green shipbuilding and new materials in of Small and Medium Enterprises)
- "Brain Circulation" promotion;
- → improving access to finance and promoting start-ups;
- scientific cooperation on fisheries and fish stocks;
- governance of maritime space;
- enhancing the network of Marine Protected Areas;
- harmonisation and enforcement of national laws with EU legislation with respect designation of 'no hunting' areas;
- brand-building of the Adriatic Ionian tourist products/services;
- sustainable tourism R&D platform on new products and services.

(b) Creation of a European Coordination Agency for EUSAIR with a focus on coastal management

One of the problems often detected within EUSAIR is the disparities between the Countries that the Strategy puts together, not only at the legislative and bureaucratic level but also in terms of infrastructure and technology. Therefore, there is a need for policies that: 1) bridge the gap between the EUSAIR countries and 2) promote common policies aimed at strengthening the objectives of the Strategy.

With this in mind, it would be desirable the creation of an **EUSAIR Coordination Agency that:**

- act as a link between the Countries and the pillars of the Strategy;
- identify the European funds available for the implementation of the Strategy;
- \bigcirc is the reference point for the promotion of joint actions in the EU legislative themes contained in the EUSAIR Pillars.

order to enhance exploitation of emerging technologies and internationalisation

to length and timing of hunting season, list of species which can be hunted,

framework in favour of the Adriatic-Ionian region for the development of the



The Agency should also promote actions aimed at:

- () identify and promote synergies arising from the individual themes contained in the Pillars of the Strategy;
- identify common coastal planning measures, including in relation to human activities, so as to ensure the best pursuit of integrated coastal zone management;
- () to counter and eliminate disparities between EUSAIR countries for a better success of the Strategy.

In relation to *point 1*), for example, consider the following possible synergies between the following sea-related issues:

- coastal planning combating coastal erosion setting up scientific research teams;
- → sustainable tourism boating sustainable vessels and infrastructure creation of clusters;
- fisheries and aquaculture activities sustainable tourism marine protected areas (environmental quality);
- sustainable tourism transport routes (motorways of the sea; intermodality; land and rail links).

These interconnections must be accompanied by legislative policies aimed, for example, at acquiring financial resources and streamlining administrative procedures.

The need to interconnect the EUSAIR Pillars must require the states that make up the strategy to act and think as protagonists and partners for the development of the Adriatic-Ionian Region and not as competitors.

The Agency, moreover, could be a spokesperson, in the EU fora (Commission and Council) of the needs (for example, in terms of funds or legislation aimed at eliminating existing gaps) as well as a bearer of the common interests of the EUSAIR Countries from the point of view of the principle of cooperation (and not "competition") for the achievement of common goals in the interest of the development of the Adriatic-Ionian region.

The EUSAIR Coordination Agency can assure a specific focus on coastal flooding and erosion through the creation of an "European coastal management Observatory".

The Observatory will have to enforce the policies on coastal protection and development according to the following guidelines:

- \bigcirc explicit objectives for a defined timescale;
- definition of clear responsibilities at the various levels of administration; does not compromise safety, important environmental values and natural
- resources;
- understanding of the sediment balance and long-term trends;
- G→ cost-benefit assessment;
- () appropriate budget for investments and maintenance as well as for a financial mechanism to locally accommodate erosion or its impacts;
- is implemented by technical measures that have proved to be fit for purpose;
- monitoring developments and effectiveness of measures;
- determination the duty to publicly report on all above aspects.

(c) Creation of a common European policy for the waste cycle

The EUSAIR Strategy moves on the concept of sustainability and promotes policies aimed at decreasing and/or eliminating any negative impact on activities involving the sea and the coast.

The European Union has for a long time initiated common legislative policies for the management and treatment of waste through the adoption of regulatory measures that are then implemented by the individual member Countries (in Italy, for example, reference is made to Legislative Decree no. 152/2006, so-called "Environmental Code").

The Third Pillar (Environmental Quality), according to the Action Plan, provides for the following actions about waste management:

- implementing a life cycle approach to marine litter;
- establishing a coordinated monitoring system and database on marine litter and marine pollution, including sources and types of litter and pollution and a GIS database on the location and sources of marine litter;
- collaboration between sectors for the development of new possibilities for marine litter recycling including production of packaging waste and fishing gears to enable recycling;



- preparation of a joint strategy for the assessment, prevention and reduction of marine litter, building on the work of MED POL programme and in line with the Regional Plan of the Barcelona Convention on Marine Litter Management in the Mediterranean, including an economic assessment of the costs and benefits of different options for reducing marine litter, as well as actions intervening at different stages of production, sources, transmission and loss;
- → supporting the preventative measures to address Abandoned, Lost or otherwise Discarded Fishing Gear (ALDFG), implementing gear marking and gear registration, marine spatial management, codes of practice for fishermen;
- () supporting clean-up programmes for both floating and sunken litter, integrating these activities with recycling programmes, and investing in necessary infrastructure;
- → drafting and implementation of a joint contingency plan for oil spills and other large-scale pollution events, building on the work on the sub-regional contingency plan developed by the Joint Commission for the protection of the Adriatic Sea and coastal areas, and on the forthcoming Action Plan for the Offshore Protocol of the Barcelona Convention;
- implementation of measures to enable joint contingency planning and coordinated emergency response;
- identifying hotspots and investing in reducing emissions of pollutants by realising a Hot Spot Inventory and aiming to depollute the sea;
- ensure prioritisation of investments to reflect the contribution to reducing pollution of the sea in the catchment area of the Adriatic and Ionian Seas;
- → address diffuse sources (e.g. nitrates from agriculture) by decreasing fertiliser use and by enhancing the recycling of nutrients through e.g. awareness raising among farmers on the impacts of excessive use of fertilisers, education and training activities on the implementation and financial aspects of environmentally friendly farming practices.

It would be desirable to align the Strategy with European policies on waste management and treatment.

It is clear that, for example, the creation of sustainable vessels, advanced waste management systems in countries with a high rate of tourism, and zero-impact port and pleasure boating infrastructure, would be concomitant with the achievement of the recycling rates set by the European Union.

This could also be a legislative reference point for non-EU EUSAIR Countries in terms of waste management and treatment

(d) Tax policies.

The disparities between the Countries of the Adriatic-Ionian region can also have an impact on taxation.

In order to implement the EUSAIR objectives and to allow also an increase in employment, it would be appropriate to launch legislative policies on taxation that facilitate the development of the Region.

Concerning this issue, in relation to the EUSAIR Pillars, it would be desirable, for example, actions aimed at guaranteeing tax relief for companies and/or subjects investing in research in the Blue Growth area (Pillar 1) or in environmental development (Pillar 3) or, again, in terms of sustainable tourism (Pillar 4). Special tax reliefs should be provided for the fisheries sector (Pillar 1 in relation to the topic "Fisheries and aquaculture") which suffers more than others from the criticality of resource depletion. In this perspective, action should be taken in order to guarantee and/or implement the income of fishing operators with initiatives related to sustainable tourism (e.g. in Italy there is a specific regulation on fish tourism and ichthyic tourism). The same tax relief should be provided for those who recruit staff in order to achieve the objectives of the Strategy in the various sectors. There should also be economic and fiscal policies to build the infrastructure needed to bridge the gap in transport and energy (Pillar 2 - Connecting the region). At the same time, tax relief should be provided for companies from EUSAIR countries investing in the region in order to pursue the objectives of the Strategy.

(e) Strategic development of maritime and intermodal transport

(Connecting the region), policies would be desirable to identify an EUSAIR Transport and Energy Agencyin order to:

- monitor naval and passenger traffic in the Adriatic-Ionian region (also in connection) with Pillar 4 - Sustainable Turisml);
- implement infrastructure and shipbuilding and yachting according to a sustainable development model (also in connection with Pillar 3 - Environmental Quality)
- (\Rightarrow) balance the energy market in the region;
- () identify common actions for the intermodal development of the Adriatic-Ionian region.

With a view to strengthening the objectives of Pillar 2



(f) Funding, Financial resources and programming EU 2021 - 2027

It is important to ensure a steady flow of economic contributions to the achievement of EUSAIR objectives.

In this context, it is useful to note that the Commission has recently adopted the Proposal for a Regulation of the European Parliament and of the Council [COM (2018) 375 final with which it intended to prepare a draft Regulation for the disbursement of European funds for the period 2021-2027 (including, as far as relevant for the purposes of this Report, the EMFF, ERDF and ESF+ funds).

In relation to the use of the funds in the period 2014-2020, some critical issues were identified, for example, the need to reduce the administrative burden and the need for flexibility to respond to emerging needs.

In this context, in the programming period 2021-2027, attention was focused on the creation of "a common set of simplified and consolidated rules, reducing the administrative burden for programme authorities and beneficiaries".

Titles II and V are of particular relevance in the draft Regulations:

Titles II and V are of particular relevance in the draft **Regulations:**

- () <u>*Title II (Strategic approach)*</u> sets five clear policy objectives:
 - 1. a smarter Europe innovative and smart economic transformation;
 - 2. a greener, low-carbon Europe;
 - 3. a more connected Europe mobility and regional ICT connectivity;
 - 4. a more social Europe implementing the European Pillar of Social Rights;
 - 5. Europe closer to citizens sustainable and integrated development of urban, rural and coastal areas through local initiatives.
- <u>Title V (Financial support</u>) has the following aims: "to reduce the administrative burden, the CPR systematises and increases the use of simplified cost options (i.e.: flat-rate reimbursement, standard scales of unit costs or lump sums)".

In particular, according to the Proposal, the following points will be implemented:

$\overline{\mathbf{a}}$

financial instruments will be better integrated into the programming and implementation process from the outset and the ex-ante assessment streamlined accordingly;

- (a) managing authorities will have the same basic flexible implementation options
- simplified;
- (\rightarrow) no more multiplication of diverse rules applied to similar situations;
- flexibility is proposed for the combination of grants with financial instruments;
- management;
- disbursements to final recipients;
- \bigcirc from one period to next.

The guidelines contained in the proposal of the EU Commission of 29.05.2018 are in line with the EUSAIR objectives and, therefore, reflected in the initiatives to strengthen the Strategy.

Shared political action by the EUSAIR countries to make the best use of EU funds is therefore essential. The EUSAIR Coordination Agency, referred above to in point B), could play a key role on this theme.

At he same way, it would be appropriate to provide a stable economic fund dedicated to EUSAIR that can be used by Countries to support the costs of organising events, studies, seminars, meetings, publications and anything else necessary to implement the Strategy.

Funding is also important for planning a wider set of actions against the coastal flooding and erosion.

Funded measures or projects should depend on the specific geomorphological characteristics of the area and should be determined on the following guidelines:

- protection of physical and economical assets;
- environmental impacts;
- \bigcirc social justice.

- management under the responsibility of the managing authority or direct management by the managing authority - but the related conditions have been

combination of EU resources will be possible under one set of rules; there will be

the eligibility rules have been clarified, and rules on management costs and fees A have been simplified while keeping them performance based to encourage efficient

the rules on payments have been considerably simplified while maintaining the all-() important link between payments to financial instruments and the corresponding

reflows and fund recycling have been simply codified, to enable a smoother flow

In this context the recommendations already pointed out by the EU Commission in the Staff Working Document of 16.12.2015 [SWD(2016) 443 final] should be shared as following:

«.... as called for by the Dubrovnik Declaration, in the light of recent developments in the region, consider including a new dimension in the strategy and its Action Plan to to target youth, cultural and educational exchanges, and integration of refugees and migrants into the labour market;

for Pillar 2, ensure better synergies and complementarity with existing instruments operating in the region, such as the 'Berlin Process', the Energy Community, etc.;

accelerate and intensify the work of laying the foundations (governance, capacity building) of the strategy: make effective use of e.g. Facility Point and other dedicated initiatives by the European Commission, with help of experts;

following the example of the EUSBSR, set up a pilot ERDF/ CF/IPA programme authorities' network aimed at facilitating support from region and country-specific as well as multicountry operational programmes to EUSAIR implementation; likewise, following the example of the EUSDR, set up a network of ESF managing authorities that could focus in particular on coordination of vocational training and job creation projects involving young unemployed in the four MS alongside young refugees and young adults in need of international protection;

building on positive experience from the EUSDR, work on the development of tools for better access to information on EU funding;

give priority to capacity-building directed at EUSAIR key implementers as well as at programme authorities responsible for EUSAIR relevant operational programmes...».

Finally, with the start of the EU programmes for the period 2021-2027, a further effort should be made in terms of policies for the development of EUSAIR through the use of financial instruments made available by the European Union.



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