Blue Plan Notes
Environment and Development in the Mediterranean
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# Protecting and enhancing the Mediterranean coastal zone, a common good under threat

Being a sea border for 22 riparian countries or territories that belong to three continents, the Mediterranean coastal zone represents an invaluable asset not only because of the value of its ecosystems and its cultural heritage, but also of its social function and its maritime identity.

This unique space, a common good of the Mediterranean countries, is coveted by human activities at the origin of considerable pressures on the environment and of conflicts over resources, leading to continuous degradation of the milieux and to often irreversible losses of biodiversity and resources.

## A limited space

The Mediterranean coastline is 46,000km long, 42% of which (i.e., 19,000 km) belonging to several islands. In 2000, the coastal zone accommodated 143 million inhabitants in 234 coastal administrative entities (Figure 1). In other words, 33% of the Mediterranean population live on 13% of the area of the riparian countries.

Figure 1: The Mediterranean coastal regions

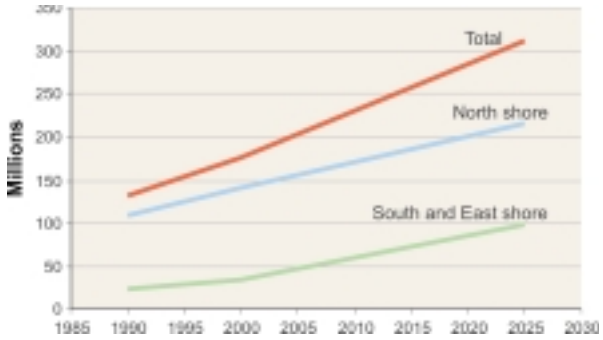

## Overdevelopment and artificial land cover of the coastal space

In the Mediterranean, the process of coastal overdevelopment (concentration of people and activities on the coastal zone) has been ongoing for several decades. It leads almost inevitably to an artificial land cover of the natural environment, whether by constructions or by restructuring.

The population in the Mediterranean coastal regions grew from 95 million in 1970 to 143 million in 2000, that is 48 million additional inhabitants within 30 years, at an average annual growth rate of 1.4 %. By 2025, this population would reach 174 million inhabitants, that is 30 million additional inhabitants, at an annual growth rate of 0.8 %. The number of cities of over 10,000 inhabitants located along the coast has practically doubled within half a century, from 318 in 1950 to 584 in 1995. By 2025, the population of coastal cities would reach 90 million, that is 20 million additional city dwellers with respect to 2000, at an increase rate of 1% per year.

In addition, the seasonal tourist flows to the coastal zone can double up the number of inhabitants during peak times. Being mostly of a seaside nature in the Mediterranean, tourism increases the pressures exerted on the coastal space, through an over-sizing of facilities and services. According to projections of national and international tourist visits, the coastal regions would be receiving 312 million tourists in 2025, as against 175 million in 2000, that is an additional 137 million tourists within 25 years (Figure 2).

**Figure 2: Domestic and international tourist visits in coastal regions 1990-2025**




Source: Plan Bleu

These demographic and tourist trends result in highly increasing infrastructures and facilities on the coastal zone. As regards transport, intensively used roads now run along a large part of the Mediterranean coast at no more than a kilometre from the shoreline (Figure 3). Often constructed too close to the shores, the roads disrupt the physical exchanges between land and sea and generate a linear urbanisation along the coast. Certain airports, built straight on wetlands, contribute to the disappearance of ecosystems of great ecological and economic value (economic value of the environmental benefits provided in the range of 2.4 million euros per km² per year).

In total for the year 2000, Plan Bleu recorded on the Mediterranean coastal areas 584 coastal cities, 750 yachting harbours, 286 commercial ports, 13 gas-producing facilities, 55 refineries, 180 thermal stations, 112 airports and 238 desalination plants.

The marine space, too, is witnessing a high increase in activities: transport, raw materials, fishing, and aquaculture. In the latter case, the production of molluscs, fish and shellfish increased from 149,000 tons in 1990 to 359,000 tons in 2001, that is an increase by 140% within 12 years at a pace of 8.3% per year.

The *artificial land cover* is expanding at an alarming pace: about 40% of the coasts are now concreted due to urban sprawl, roads, tourist facilities, ports. According to Blue Plan projections, by 2025, the artificial land cover of the coastal strip (0-10 km) would reach values close to saturation in Spain, Egypt and Lebanon.

The trend-based scenario assumes an additional 200 km of built-up coasts per year, leading to a loss of about 5,000 kilometres of natural areas by 2025. Half (50 %) of the Mediterranean coast may end up built-on, with large coastal conurbations extending over tens if not hundreds of kilometres. Destruction of farmland and shallow sea bottoms, disruption of water regimes with risks of devastating floods, exacerbation of coastal erosion: these are the main impacts of the artificial land cover process on the coastal ecosystems and landscapes. And here what is lost is lost forever.

## Pollution and degradation of the coastal environment

*Land-based pollutions* represent 80% of total pollution affecting coastal waters, the remaining 20% being due to activities at sea. In the Mediterranean, the major pollutions relate to:

➤ Eutrophication (nitrogen and phosphorous nutrients stimulating the primary aquatic production), which originates, for over three quarters, from diffuse agricultural discharges;

➤ Chemical contaminations, mainly due to industrial discharges;

➤ Organic and microbiological pollutions, which are caused by untreated domestic and industrial wastewater discharges and affect directly the quality of bathing water. Yet, certain countries either have no wastewater treatment system or only have a small portion of the population connected (Figure 4);

➤ Solid and dangerous waste: coastal districts generate between 30 and 40 million tons of solid waste per year (discharges from households, tourism and landfills), and are likely to produce, according to the trend-based scenario, about 71 million tons of domestic waste by 2025, that is about twice the volumes for 2000.

Among the many causes of *degradation of habitats* and of *loss of biodiversity*, coastal erosion affects a significant part of the Mediterranean coastline. The phenomenon has been strongly exacerbated by anthropogenic action, with watershed development (solid inflows to the sea reduced

**Figure 3: Road and airport infrastructures along coasts**

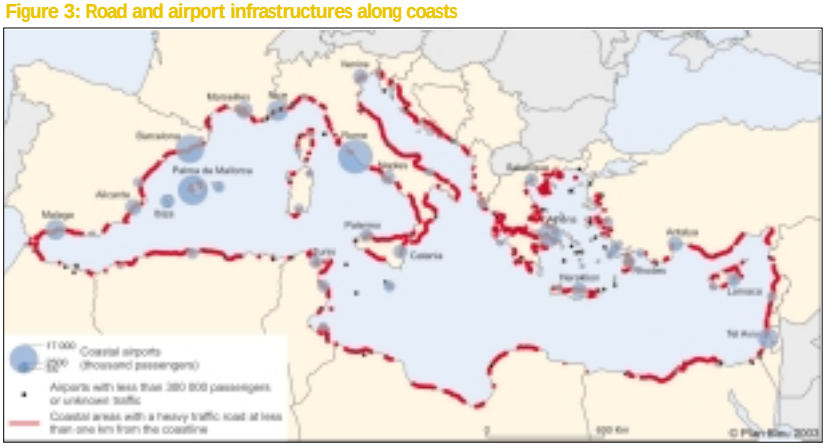
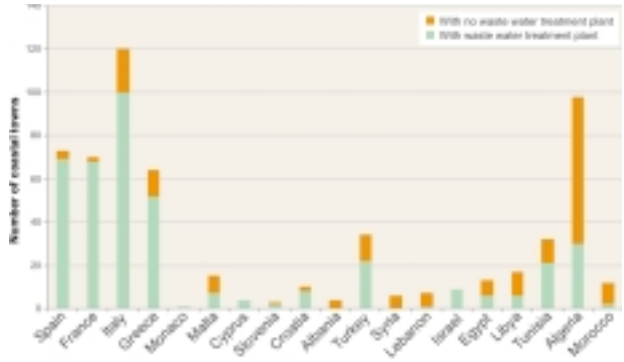


Figure 4: Wastewater treatment by coastal cities with more than 10,000 inhabitants.




Source: UNEP / MAP / MEDPOL, 2003

by 90% over the past 50 years), sand extraction, construction of sea embankments and restructuring of the coast.

In terms of biodiversity, the Mediterranean is considered as one of the most threatened seas of the planet. One hundred and four (104) endangered species have been inventoried there, among which the emblematic seal monk *Monacus monacus* and the turtle *Caretta caretta*.

Biological invasions constitute, on world level, the second major cause of loss of biodiversity, ranking next to physical destruction of habitats. In the Mediterranean, there are about 500 non-indigenous marine species, introduced for the major part (64 %) via the Suez Canal and by vessels. The biological invasions receiving most press coverage in the Mediterranean are the alga *Caulerpa taxifolia* and, to a lesser extent, the alga *Caulerpa racemosa*.

The degradation of coastal water resources, due to their over-exploitation for irrigation and for needs of coastal cities, leads to saline intrusions reported in several coastal plains.

Fishery resources have given rise to a significant activity sector in the Mediterranean, characterised by the importance of small-scale fishing, multi-activity of fishermen and sport fishing. The overall increase in the fishery effort leads to increasing catches, but is accompanied by a drop in yields, which is a sign of stock degradation. For certain species, the overall catch per fishing unit is 60% less today compared with about 20 years ago.

## Threats due to climate change

Climate change is likely to generate highly adverse impacts on the whole range of activities, above all on agricultural yields and tourist visits. Coastal erosion, as well as the development of invasive species, would be accentuated. Risks of forest fire, violent floods, landslides and storm surges would also be on the increase. In the event of a sea level rise, deltas would be the most vulnerable. Egypt would be particularly affected: a rise by 50cm would affect 3.8 million inhabitants and 1,800 km² of farmland; a rise by 1m would affect 6.1 million inhabitants and 4,500 km² (Figure 5).

## Strengthening coastal policies for a sustainable coastal zone management

In order to *urgently stop and reverse the continuing degradation of coastal areas*, the sustainable coastal management scenario, called the "alternative" scenario, implies a significant reinforcement of coastal policies. On the Mediterranean regional level, the riparian countries and the European Community have had since 1976 a common legal framework, the Barcelona Convention for the Protection of the Sea, extended in 1995 to the coastal areas and to watersheds. The adoption by the Parties to the Barcelona Convention of a Protocol on Sustainable Management of Mediterranean Coastal Areas, in process of drafting, would provide a clear signal of the resolve to change, and help countries develop or strengthen their policies.

Ample room for progress exists with regard to setting up regulatory and institutional tools: in 2004, only five countries (Algeria, France, Greece, Lebanon and Spain) already had a frame-law on the coastal zone, and three countries (Algeria, France and Tunisia) had coastal dedicated agencies.

In order to combat land-based pollution, as part of the implementation of the specific protocol of the Barcelona Convention, a Strategic Action Plan was adopted in 1997, then detailed in National Action Plans, setting ambitious objectives of pollution reduction up to 2025: wastewater treatment of all coastal cities, reduction of industrial pollutants and of dangerous waste. However, significant implementation difficulties persist in a context of increasing disparity of response capacity among the EU member countries or future members, and the other riparian countries.

Figure 5: Potential impacts of a sea level rise on the Nile delta


Source: UNEP/GRID-Arendal Maps and Graphics Library ; http://maps.grida.no/go/graphic/potential_impact_of_sea_level_rise_nile_delta, acceded on 24 May 2007

Figure 6: Specially Protected Areas of Mediterranean Interest (SPAMI) and Ramsar listed wetlands


Source: MEDWET 2003, Specially Protected Areas Regional Activity Centre (SPA RAC), Tunis

Progress has been reported in recent years on protection of sensitive sites: 81 of the wetlands listed under the Ramsar Convention are located in the Mediterranean basin and 14 coastal or marine protected areas have been listed as "Specially Protected Area of Mediterranean Interest" or SPAMI (Figure 6). The alternative scenario also assumes the development of new generations of protected areas and a significant increase of their surfaces. The Mediterranean Strategy for Sustainable Development, adopted by the riparian countries and the European Community at the end of 2005, recommends the provision of at least 10% of the coastal and marine habitats with forms of protection meeting the criteria of IUCN (World Conservation Union). Similarly, 30 SPAMI are to be designated in the coming years, especially in the eastern basin.

Besides these reinforced measures for combating pollution and for protection, the alternative scenario assumes further upstream actions aimed at mitigating coastal overdevelopment and artificial land cover, particularly through:

- Stopping continuous linear urban development by introducing green areas and by favouring traverse road access to the sea, which is likely to ensure conservation and sustainable management of additional 4,000km of coastline up to 2025 in order to preserve functional ecosystems and a quality coastal area for local populations and sustainable tourism;
- Relieving coastal zones, by directing part of tourist flows from the coast towards inland areas and by shifting the transport modal share towards sea and railway transport;
- Regulating tourism development, based on economic tools that make the sector contribute to upkeep the environment, on the definition of accommodation capacity, and on the search of synergies with traditional activities (agriculture, fishery, building and public works).

Finally, moving towards the alternative scenario also implies local level action, by multiplying collective exercises of territorial prospective[1] in order to define territory-specific projects based on a common vision and set objectives for which a set of indicators would monitor progress. Development of knowledge (observation, analysis and monitoring of trends) and a wide dissemination of information constitute added value of such approaches.

**Note :**

[1] Plan Bleu has developed in this regard the prospective method "*Imagine*".

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