

CO-EVOLVE

Promoting the co-evolution of human
activities and natural systems for the
development of sustainable coastal and
maritime tourism

Deliverable 3.3.1

State of the Art

Activity 3.3

Threats to co-evolution in touristic areas -
Mediterranean scale: Littoralization and
urbanization

WP3

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1. Introduction

The vast majority of the world population lives and works in urban areas. With more than half of the world's population already urbanized and with further changes to the size and spatial distribution of the global population (United Nations, 2014), urbanization constitutes a dominant driving force of development worldwide which, therefore emerges at the forefront of the policy-making agenda.

Urbanization is *the increase over time of urban population in proportion to the region's rural population* (Plan Bleu, 2015). In many cases, it is confused with “urban sprawl”. Although there is often a strong relation between them (urbanization usually preexists urban sprawl; urban sprawl appears when urban population growth rate surpasses the rate of total population), they refer to different processes. Urbanization is neither uniform nor constant. In order to understand it, it is necessary to take into account the specific geographical and historical context in which it is developed. In this respect, the dispersed form or “urban sprawl” has become a remarkable characteristic of urban development (Catalán et al, 2007).

The features, intensity, causes or impacts of urbanization may differ also depending on its spatial reference. Of particular interest for the Mediterranean Region is urban growth in coastal areas. **Coastal urbanization**¹ is *an unprecedented global trend in which populations are migrating to and concentrating in cities and metropolitan areas in coastal regions transforming them into some of the most valuable and densely developed land around the world* (Urban Land Institute, 2013). It is a process driven by the specific economic, geographical and aesthetic characteristics of coastal zones, which put them at risk. Coastal urbanization is also termed as **littoralization** - *the process, in which people, activities, infrastructures and facilities are concentrated close to the coast* (Barragán 1994 cited by De Andrés et al., 2017). According to McGranahan et al. (2007), excessive (and potentially rapid) coastal settlement has two major threats from an environmental point of view: the likelihood of damaging sensitive and important ecosystems and other resources (water, soil, etc.) and exposing residents to potential seaward hazards such as sea-level rise and tropical storms that can be even more intensive because of climate change.

¹ In the EU, a coastal region is defined as a NUTS 3 region with either a sea border or without a coastline but where more than half of the population lives within 50 kilometers (km) of the sea. Coastal regions are distributed along oceans and seas (also called sea basins) bordering the EU coastline, i.e. the Baltic Sea, the North Sea, the North East Atlantic Ocean, the Mediterranean Sea, the Black Sea and outermost regions (Eurostat, c2017).

Europe is among the most urbanized regions in the world. In Southern Europe, and especially in the Mediterranean region, the phenomenon is long-standing and even intense. Coastal urbanization, namely land occupation by urban land uses and related infrastructures in coastal areas, was mainly initiated after the industrial revolution but expanded rapidly only in the middle of the 20th century due to economic development that followed World War II (Zdruli, 2008), affecting its economic, social and environmental characteristics.

2. *Littoralization & Urbanization in the Mediterranean – state of the art*

2.1 *Urbanization in the Mediterranean region over the years (population density, urbanization rate) – trends*

Since 1950, world urban population has been continuously growing; in 1950, 29.53% of the population resided in urban areas while in 2010 the percentage reached 46.45%. This trend is likely to continue in the future, however, with slower growth rate from 2000. As the projections show, urban population is expected to increase even more and exceed the 65%² by 2050. On the other hand, rural population seems to fluctuate; since 1950 it has grown slowly although it was supposed to decline by 2050 (United Nations, 2014). In Europe, during the same period (1950 - 2050), the percentage of urban population also increases from 49.86% in 1950 to 70.48% in 2010, exceeding the 79% in 2050.

Focusing on the Mediterranean region, it was and still is under strong pressure because of a wide range of interrelated factors. Urbanization (and especially coastal urbanization), which affects and is simultaneously affected by those factors, is a good example proving that the Mediterranean is a receptor of conflicting and land-consuming interests that define its development. While Mediterranean cities have been traditionally considered as compact, the majority of them are gradually adopting a dispersed pattern of development (Salvati, 2014). Nowadays, with the increase of urbanization rates, almost six out of ten European cities, where sprawl is growing fastest, are located in the Mediterranean.

Mediterranean urban population is intertemporally increasing, following the European urbanization trend, but with lower growth rate over the years. Between 1950 and 2010, the Mediterranean **urbanization rate** increased from 42.86% to 65.63%, while estimations show that, by 2050, 73.96% of the Mediterranean population will live in urban areas.

² Data retrieved from United Nations Environmental Programme Data Set (2015).

Table 1: Population residing in urban areas (1950-2050)

		1950	1960	1970	1980	1990	2000	2010	2020	2030	2040	2050
World	UP	742601625	1013500707	1340993719	1735238385	2264395740	2832083264	3544216661	4308032391	5025773820	5681081410	6302561431
	TP	2514834894	3004699890	3664039446	4416830242	5283321102	6097593296	6896019573	7720141888	8459324767	9112637136	9677974051
	%	29.53%	33.73%	36.60%	39.29%	42.86%	46.45%	51.40%	55.80%	59.41%	62.34%	65.12%
Europe	UP	298098806	370954926	450457103	517765525	574096724	595324913	630495494	663225517	690028941	713012975	730230327
	TP	597884755	670265826	740894988	797677649	846832589	867510721	894521955	920877366	929185963	928364893	922282203
	%	49.86%	55.34%	60.80%	64.91%	67.79%	68.62%	70.48%	72.02%	74.26%	76.80%	79.18%
Mediterranean	UP	92191051	119205123	157204490	194170080	235384325	271731354	320677604	366727632	408432832	446716670	479758456
	TP	215078886	249356896	290815753	337657152	388492561	434132353	488621745	537703515	581060504	618311008	648641595
	%	42.86%	47.81%	54.06%	57.51%	60.59%	62.59%	65.63%	68.20%	70.29%	72.25%	73.96%

United Nations Environmental Programme Data Set (2015), Own Processing

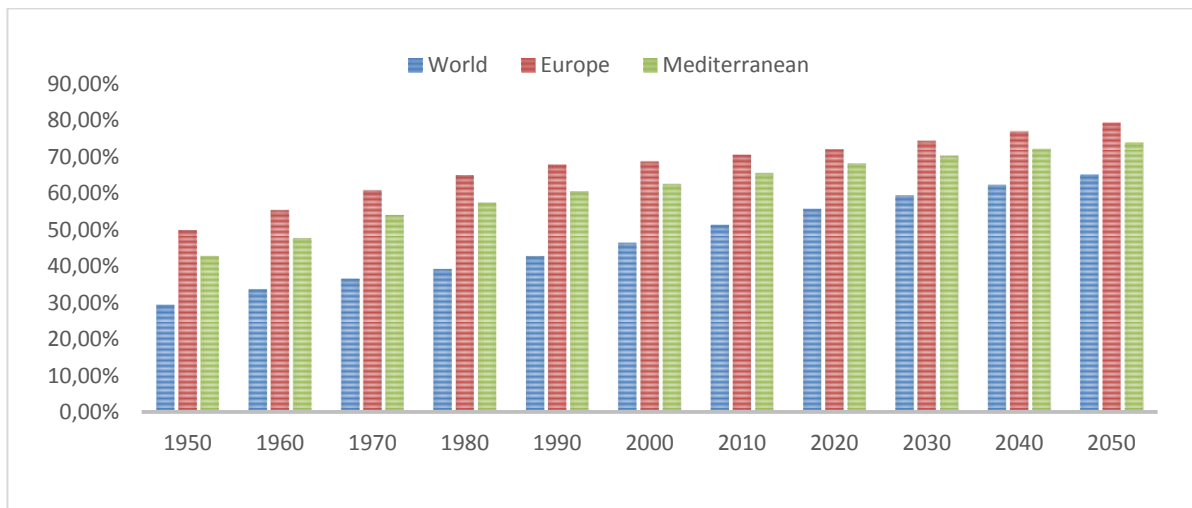


Figure 1: Population residing in urban areas (%) (1950-2050)

United Nations Environmental Programme Data Set (2015), Own Processing

Although urbanization rate increases among the Mediterranean countries, non-EU countries have significantly stronger trends. In West Asia, urban population grows more rapidly meaning that it urbanizes much faster and projections suggest that this trend will continue until 2050. Additionally, urbanization growth in African Mediterranean is faster than in European where the urban population growth rate is lower than the average Mediterranean rate. As Salvati (2014) noted, although the urbanization rate of European countries is expected to increase by a moderate degree by 2050, North African countries' rate will grow even more rapidly.

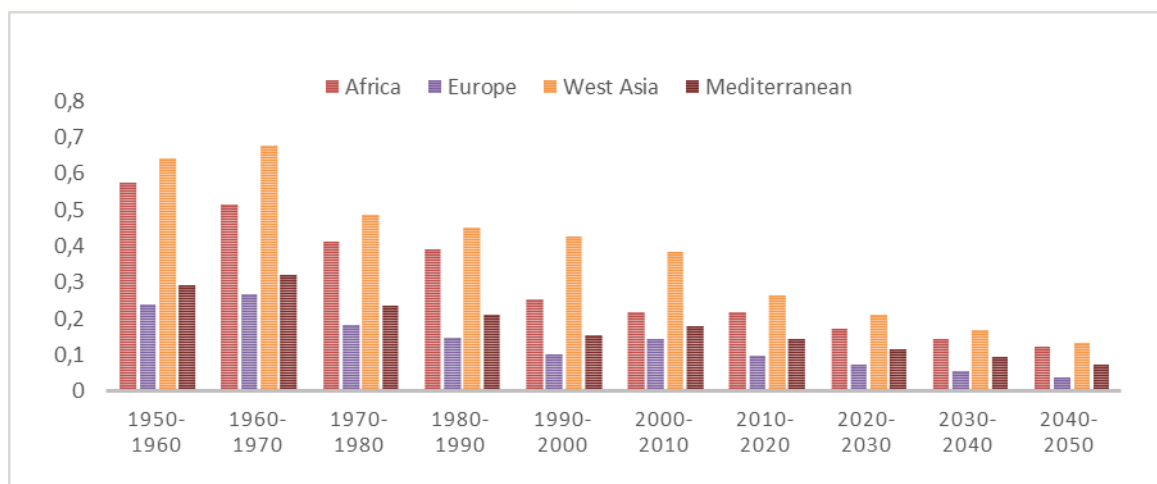


Figure 2: Urban Population Growth Rate (1950-2050)

United Nations Environmental Programme Data Set (2015), Own Processing

Another difference between northern and southern countries in the Mediterranean refers to the distribution of the population. According to EEA (1999), in 1950, the “north” represented two-thirds of the total population, while today the percentage has decreased to 50%, eventually leading to maybe one-third in 2025 and one-quarter in 2050.

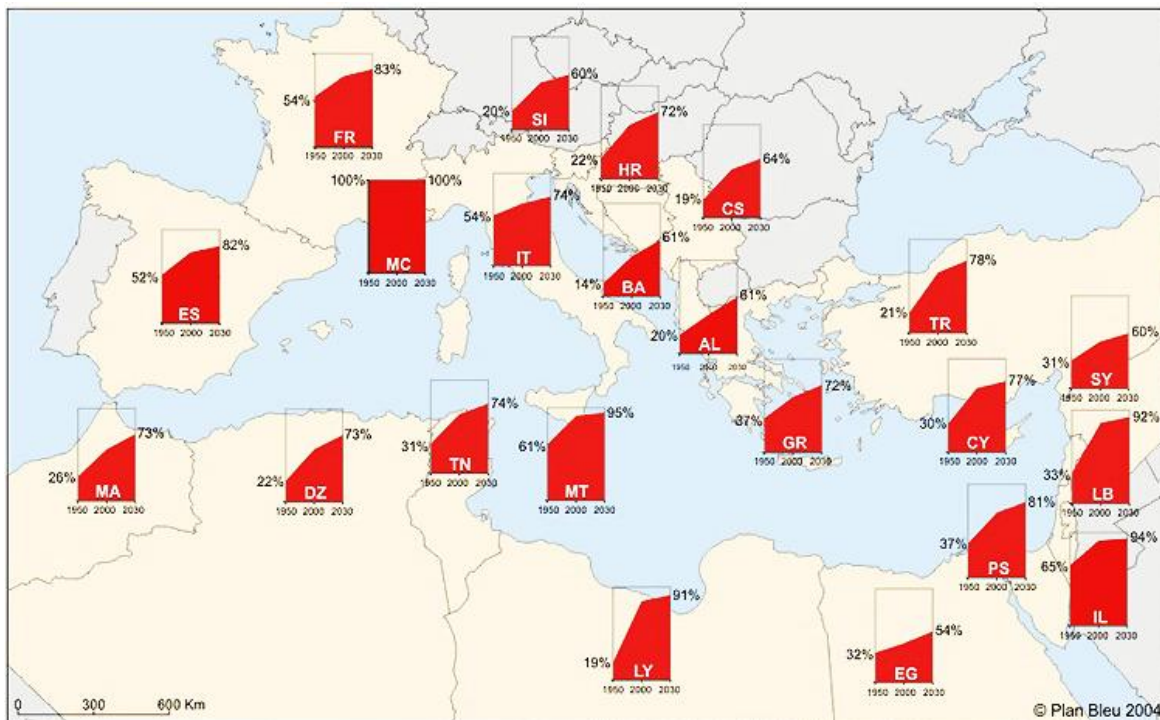
Regarding Mediterranean countries, in some of them the percentage of population residing in urban areas is going to exceed 90% by 2050 (e.g. Malta, France), in others it will triple (e.g. Cyprus, Croatia) or even quadruple (e.g. Algeria) from 1950 to 2050.

Table 2: Percentage of population residing in urban areas by country (1950-2050)

	1950	1970	1990	2010	2030	2050
Algeria	22.2	39.5	52.1	72.0	83.3	87.4
Egypt	31.9	42.2	43.5	43.4	49.6	60.0
Libya	19.5	49.7	75.7	77.6	81.5	85.1
Morocco	26.2	34.5	48.4	56.7	64.6	72.5
Tunisia	32.3	43.5	57.9	66.1	71.2	77.2
Cyprus	28.4	40.8	66.8	70.3	75.0	80.3
Israel	71.0	84.2	90.4	91.8	93.0	94.1
Jordan	37.0	56.0	72.2	82.5	86.5	89.0
Lebanon	32.0	59.5	83.1	87.1	89.3	91.2
State of Palestine	37.3	54.3	67.9	74.1	78.6	82.9
Syrian Arab Republic	30.6	43.3	48.9	55.7	64.0	72.2
Turkey	24.8	38.2	59.2	70.5	83.1	87.3
Albania	20.5	31.7	36.4	52.3	69.1	77.1
Bosnia and Herzegovina	13.7	27.2	39.2	47.7	58.7	68.9
Croatia	22.3	40.3	54.0	57.5	64.8	72.5
Greece	37.3	52.5	58.8	61.2	67.6	74.6

Italy	54.1	64.3	66.7	68.2	73.2	78.7
Malta	88.9	89.7	90.4	94.7	96.7	97.6
Montenegro	12.7	26.9	48.0	63.1	68.0	74.3
Portugal	31.2	38.8	47.9	60.5	69.8	77.2
Spain	51.9	66.0	75.4	77.3	80.9	84.5
France	55.2	71.1	74.1	85.2	91.4	93.3

Salvati, 2014 (data retrieved from UN demographic statistics 2012)



Source : UN Pop Division, World Urbanization Prospects, The 2003 Revision

Figure 3: Urbanization rate in the Mediterranean countries and forecasts, 2025

However, this does not necessarily imply that rural population will necessarily decrease. There are fluctuations among countries and among periods. There are countries in which both urban and rural population increase, a phenomenon mainly observed in West-Asian and north-African Mediterranean. In other countries, rural population gradually decreases. These patterns are encountered in both EU and non-EU countries.

Table 3: Urban & rural population (percentages and average annual rate)

	Urban Population			Proportion (%) Urban Population			Rural Population			Average annual rate
	1990	2014	2050	1990	2014	2050	1990	2014	2050	2010-2015
Albania	1256	1797	2345	36	56	76	2191	1389	749	1.9
Algeria	13667	28002	44787	52	70	82	12573	11927	9736	0.9
Bosnia and Herzegovina	1777	1515	1839	39	40	55	2750	2310	1492	0.3
Croatia	2590	2506	2606	54	59	72	2203	1766	1000	0.5
Cyprus	512	773	977	67	67	72	255	380	379	-0.2
Egypt	24494	35914	68864	43	43	57	31843	47473	52934	0.1
France	42098	51253	63174	74	79	86	14748	13388	10037	0.3
Greece	7261	8644	9158	71	78	86	2899	2484	1510	0.4
Israel	4065	7202	11189	90	92	94	434	620	655	0.1
Italy	37922	42029	46640	67	69	78	18910	19041	13375	0.2
Lebanon	2247	4354	4874	83	88	92	456	612	442	0.1
Libya	3226	4900	7155	76	78	86	1034	1353	1195	0.2
Malta	339	410	405	90	95	97	36	20	12	0.2
Montenegro	295	397	403	48	64	72	319	225	154	0.3
Morocco	11940	19995	31721	48	60	74	12734	13498	11163	0.9
Palestine	1409	3328	7408	68	75	83	672	1108	1499	0.3
Slovenia	1010	1031	1225	50	50	61	994	1044	798	-0.2
Spain	29299	37349	41601	75	79	86	9584	9717	6624	0.3
Syria	6093	12588	26245	49	57	72	6359	9398	10461	0.7
Tunisia	4714	7409	10108	58	67	77	3421	3708	3084	0.3
Turkey	31966	55279	79189	59	73	84	22028	20559	15418	0.7

World Urbanization Prospects (United Nations), 2014

Population Density (persons per square km) is another useful indicator that, combined with urban population, can provide useful information. According to United Nations (2015), the Mediterranean's population density varies among countries and periods. Except for countries where it increases steadily, in others, it has already started or is going to decrease. The last is due to the loss of part of their total population because of either lower fertility or migration flows to central and northern Europe. The different trends between urban and total population, however, prove that, in European Mediterranean cities, urbanization rates grow much faster than population since the 1970s. This trend is evident in some of the largest cities of Spain, France, Italy and Greece (Tombolini et al., 2015).

Table 4: Population Density (people per square kilometer) 1950-2050

	1950	1960	1970	1980	1990	2000	2010	2020	2030	2040	2050
Albania	46.101 13	59.71	78.4891 2	97.855 66	119.76 11	113.94 03	105.90 81	107.122 1	107.79 28	104.20 19	98.9136 9
Algeria	3.7251 11	4.6709 1	6.10899 3	8.1191 58	10.879 59	13.092 81	15.130 18	18.0572 9	20.268 42	22.041 15	23.7058 7
Bosnia and Herzegovina	52.182 22	63.029 8	73.4438 6	81.269 14	88.764 63	74.370 16	75.201 14	73.6891 6	70.270 98	65.498 24	60.1705 5
Croatia	68.804 41	74.921 98	79.0399	82.168 08	85.353 36	79.129 18	77.134 11	74.3834 7	71.060 28	67.392 14	63.5172 3
Cyprus	53.464 72	62.005 3	66.4089 8	74.178 14	82.966 56	102.08 73	119.44 64	131.843 5	140.71 67	147.11 99	151.728 4
Egypt	20.992 75	27.196 14	34.9677	43.567 79	56.655 05	68.647 25	82.415 99	100.977 3	117.63 71	135.04 28	151.801 7
France	76.484 47	83.764 25	92.8557 8	98.717 07	103.99 52	108.45 84	114.98 55	120.024 1	124.20 17	127.71 45	129.916 2
Greece	58.696 68	64.479 33	68.1045 5	74.633 62	78.601 53	84.980 85	86.714 58	83.9830 3	81.301 71	78.538 18	75.2929 2
Israel	58.131 75	96.575 37	131.683 1	173.04 38	207.90 95	277.89 79	342.90 06	402.876	462.02 74	522.24 86	582.723 4
Italy	158.42 32	169.01 8	181.963 2	191.52 94	193.81 1	194.28 53	202.58 38	203.105 1	200.92 55	197.44 87	192.128 8
Jordan	5.0558 8	10.009 37	18.6389 8	25.689 01	37.828 94	53.699 89	73.416 45	91.9891	102.60 16	118.17 76	131.972 6
Lebanon	130.46 12	176.43 47	224.575 1	254.67 19	264.22 47	316.26 39	423.96 44	575.903 7	517.27 02	539.32 9	548.401 3
Libya	0.6327 69	0.8153 13	1.2016	1.8137 15	2.4997 55	3.0333 29	3.5609 86	3.80786 2	4.2159	4.5351 52	4.75976 6
Malta	974.99 06	977.46 25	951.293 8	999.68 13	1111.5 84	1209.9 38	1287.7	1321.75	1337.5 81	1322.3 19	1284.55
Montenegro	29.348 55	36.239 11	38.6391 8	43.178 81	45.724 83	45.617 62	46.241 78	46.5307 1	45.930 48	44.628 55	42.7109 3
Morocco	20.134 42	27.623 87	35.9390 5	44.974 01	55.904 39	64.867 92	71.942 05	81.6588	89.148 08	94.439 67	97.9083 1
Portugal	91.898 34	96.902 62	94.6648 3	106.51 42	107.98 47	112.22 34	115.56 76	110.938 2	107.48 79	104.55 35	100.617 4
Slovenia	73.142 7	78.780 14	82.8988 6	91.153 87	99.628 6	98.741 41	101.91 06	103.029 3	101.96 5	99.457 55	96.4219
Spain	56.274 53	61.048 5	68.0097	75.591 15	78.572 68	81.695 67	93.427 21	92.6093 5	92.060 29	91.514 54	89.8960 9
State of Palestine	154.80 5	177.64 1	186.851	250.74 49	349.02 92	535.51 18	675.87 71	885.943	1123.7 18	1371.9 27	1626.36
Syrian Arab Republic	18.588 08	25.011 04	34.7372 5	48.772 84	67.807 76	89.059 79	112.83 89	114.325 5	156.00 65	174.64 71	190.069 2
Tunisia	23.206 17	26.881 22	32.5720 5	40.989 76	52.991 74	62.430 43	68.480 91	76.1797 4	81.656 3	84.744 03	86.7372 7
Turkey	27.595 72	35.800 68	45.1801 9	57.047 92	70.156 58	82.169 56	93.954 78	106.877	113.97 29	120.50 47	124.500 6

United Nations Database, 2015

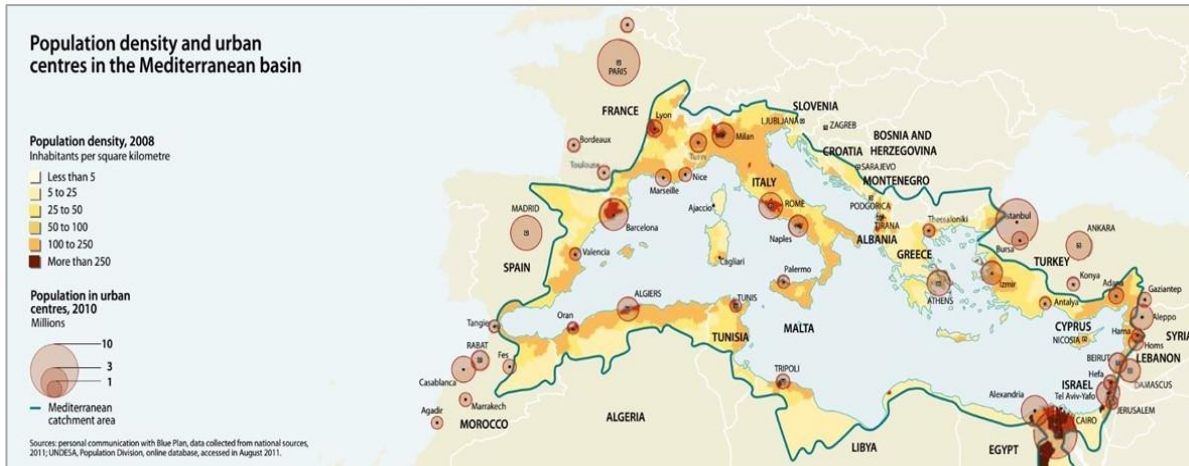


Figure 4: Population density and urban centers in the Mediterranean basin

UNEP/MAP, 2012

The **Degree of urbanization (DEGURBA)** is a classification that indicates the character of an area³. Based on the share of local population living in urban clusters and centers, it provides three types of areas: Cities (densely populated areas), Towns and Suburbs (intermediate density areas) and Rural Areas (thinly populated areas)⁴ (Eurostat, c2017). Population by degree of urbanization, for 2011, reflects the current situation in the Mediterranean region where 48% of the population lives in cities, 32,97% in towns and suburbs and 21,40% in rural areas. These percentages are not representative of all countries, as urbanization does not occur in the same way or at the same degree. For instance, in Cyprus, population in cities exceeds 50% (58,37%), while in Slovenia it is limited to 18,75%.

³ The latest update of the classification is based on 2011 population grid and the 2014 Local Administrative Units (LAU) boundaries. The next major update will be based on 2020 Census results.

⁴ Cities (alternative name: densely-populated areas): at least 50 % of the population lives in an urban centre. Towns and suburbs (alternative name: intermediate density areas): less than 50 % lives in an urban centre but more than 50 % of the population lives in an urban cluster. Rural areas (alternative name: thinly populated areas): more than 50 % of the population lives in rural grid cells.

Table 5: Population by degree of urbanization (2011)

	Total	Cities	% Cities	Towns & Suburbs	% Towns & Suburbs	Rural Areas	% Rural Areas
Greece	6.507,483	2.870,432	44,11%	766,279	11,78%	2.870,772	44,11%
Spain	29.104,321	14.761,202	50,72%	7.334,618	25,20%	7.008,501	24,08%
France	39.564,229	19.333,662	48,87%	13.590,769	34,35%	6.639,797	16,78%
Croatia	2.731,034	1.506,992	55,18%	1.221,293	44,72%	:	:
Italy	36.737,734	17.069,874	46,46%	14.892,978	40,54%	4.774,881	13,00%
Cyprus	569,671	332,538	58,37%	84,515	14,84%	152,618	26,79%
Malta	289,143	245,5	84,91%	22,388	7,74%	21,255	7,35%
Portugal	7.096,814	3.157,292	44,49%	2.465,463	34,74%	1.474,059	20,77%
Slovenia	1.422,522	266,74	18,75%	509,031	35,78%	646,75	45,47%
Eur. Mediterranean	13.780,328	6.616,026	48,01%	4.543,037	32,97%	2.948,579	21,40%

Eurostat, 2015

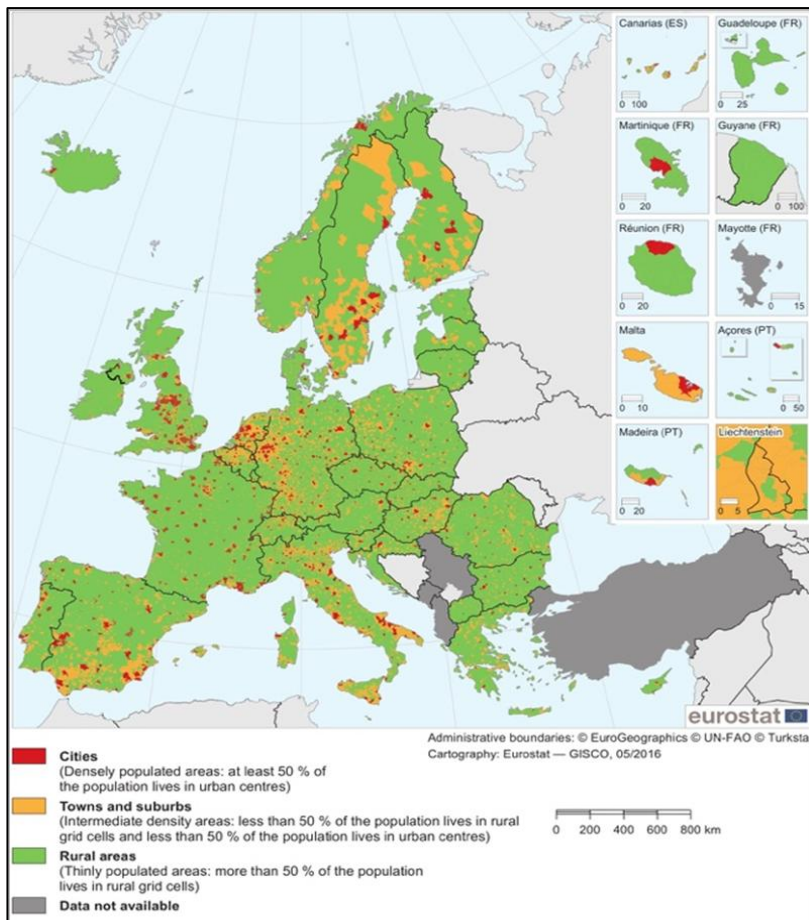


Figure 5: Degree of urbanization for Local Administrative Units level

Eurostat, c2017

2.2 Littoralization in the Mediterranean region

Littoralization in the Mediterranean has been a general trend over the last two centuries. This is mainly due to its physical features (e.g. vast areas of hills, plateaux and mountains) that characterize the inland areas of the Mediterranean region, which present considerable structural handicaps for urbanization. It is also an important historical element as evidence of the economic and social relations over the centuries among Mediterranean cultures⁵ (Salvati, 2014).

These trends are confirmed also by the increase of **population within 100 kilometers of the Mediterranean coast**. From 1975 to 2005, a period for which data is available, it has increased almost 1.5 times, with clear differences among the European, African and West Asian regions and with the population of European countries changed (increased) to a lesser extent compared to the African and even more to West-Asian countries.

Table 6: Population within 100 kilometers of Coast (1975-2005)

	GEO Region	1975	1980	1985	1990	1995	2000	2005	1975-2005 Change
Albania	Europe	22886	25515	28192	31367	30034	29371	30077	31.42%
		40	50	30	30	90	40	20	
Algeria	Africa	11415	13418	15761	18037	20164	21764	23421	105.18%
		200	200	800	700	500	300	900	
Bosnia and Herzegovina	Europe	10648	11128	11719	12257	97259	10763	11132	4.55%
		70	80	80	30	5	50	80	
Croatia	Europe	15608	16024	16358	16499	17032	16472	16617	6.46%
		60	50	30	30	50	50	50	
Cyprus	Europe	60974	61148	64828	68126	73177	78560	83560	37.04%
		3	5	9	2	9	8	9	
Egypt	Africa	16964	18910	21296	23870	26256	28803	31541	85.93%
		200	800	100	700	800	000	100	
France	Europe	20954	21427	21981	22570	23156	23559	24217	15.57%
		100	100	600	000	300	700	500	
Greece	Europe	89879	95821	98706	10094	10574	10874	10997	22.35%
		30	00	00	100	000	000	000	
Israel	Europe	33531	37580	40960	45060	53654	60743	66806	99.23%
		70	80	50	10	30	40	10	
Italy	Europe	43105	43884	44011	44105	44563	44867	45550	5.67%
		200	900	400	500	600	300	800	
Jordan	West Asia	62515	71847	87349	10506	13889	15498	17902	186.37%
		3	5	1	00	60	50	40	
Lebanon	West Asia	27375	27848	28917	29747	34915	37735	40103	46.49%
		40	10	50	00	10	00	20	

⁵ Littoralization has intensified mostly by the end of the 20th century due to developing international tourism on the shores of the Mediterranean

Libya	Africa	21983	27434	34410	39050	43220	47783	52829	140.32%
		00	40	60	40	10	60	40	
Malta	Europe	30422	32413	34438	36013	37779	38893	40258	32.33%
		6	2	2	8	7	5	6	
Montenegro	Europe	42728	44745	44741	45574	48436	52118	47302	10.70%
		5	9	0	8	6	8	5	
Morocco	Africa	11305	12783	14559	16207	17602	18828	19917	76.17%
		900	000	300	700	700	700	900	
Portugal	Europe	82133	88246	90483	90245	90649	92453	95144	15.84%
		40	10	90	70	60	10	60	
Slovenia	Europe	10004	10523	10829	11071	11284	11392	11472	14.67%
		30	20	60	20	20	00	30	
Spain	Europe	24122	25368	25970	26261	26627	27183	29294	21.44%
		700	600	100	700	400	000	900	
State of Palestine	West	12552	14762	17833	21545	26170	31496	37626	199.75%
	Asia	40	10	70	40	90	20	00	
Syrian Arab Republic	West	49917	59403	71628	84241	96769	10935	12511	150.65%
	Asia	00	30	90	50	90	100	600	
Tunisia	Africa	48851	55618	63107	70791	77315	82377	86972	78.03%
		90	70	90	20	80	10	20	
Turkey	Europe	23842	26799	30120	33156	36311	39455	42164	76.85%
		800	000	900	000	500	100	800	
Mediterranean Countries (sum)		19621	21168	22732	24203	25731	27157	28799	46.78%
		3717	3801	9672	8788	7027	4561	7090	

UNEP/MAP, 2012

Population density by coastal regions is another indicator which can provide a clear view of littoralization in the Mediterranean. However, the data is available only for a restricted number of northern Mediterranean countries and for a small period (1990-2010), making it difficult to export safe conclusions and estimate future trends.

Population density at the European coast of the Mediterranean, from 1990 to 2013, is continuously increasing but with lower growth rate over the years (according to Eurostat Data, 2016). Population density along the European coast is higher and continues to grow faster than in the hinterland, yet differences are less pronounced than globally (Iglesias-Campos et al., 2015). Generally, the hinterland and the coastal areas have a different pattern of urban development; in some coastal regions their population has multiplied by seven times in a century while population in the hinterland has sometimes declined drastically (Plan Bleu, 2003). This could be explained by the particularities (e.g. structure of the economy, urban patterns, land-uses etc.) of these areas.

Among different countries, population trends vary. For instance, population density of Greek coastal areas is increasing but the growth rate is decreasing intertemporally, while in

Cyprus it is increasing steadily⁶ (according to Eurostat Data, 2016). According to EEA (2013), the share of the population living in a coastal area, as well as the population density, depends on many factors: historical trade routes, economic development, climatic differences and geographical characteristics such as the accessibility and configuration of the coastline.

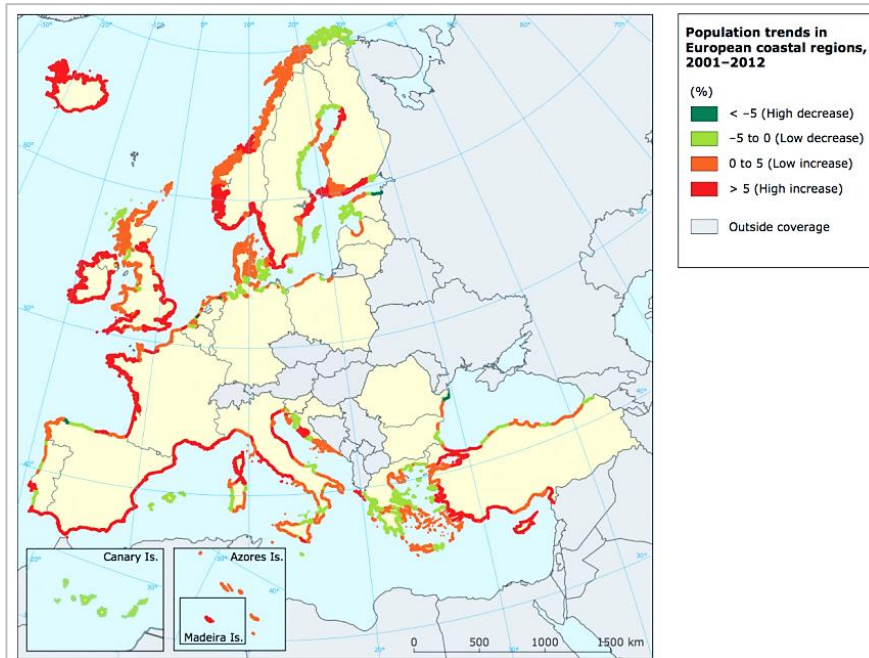


Figure 6: Population trends in European coastal region, 2001-2012

EEA, 2013

The same heterogeneity can be observed among the 149 NUTS III regions of the European Mediterranean for 1995-2015 statistical period (ANNEX, Table 2: Population density by NUTS 3 in Mediterranean region).

The table below provides a comparison of the population density change (1995-2015) at NUTS III level with the tourism typology⁷ provided in the context of CO-EVOLVE Project.

⁶ See ANNEX, Table 1

⁷ (Deliverable 3.16.1. Building a common approach in tourism sustainability evaluation).

Table 7: Population density change (average) 1995-2015 and CO-EVOLVE tourism typology

High share - High positive trends	High share - Medium positive trends	High share - Negative trends
19%	12,6%	3,9%
Low share - High positive trends	Low share - Medium positive trends	Low share - Negative trends
-2,1%	4,3%	-1,6%

Eurostat 2017, Own Processing

According to the table, a steady increase of the average population density change can be observed in all types of tourism development except for 'Developing destinations with high tourism dynamic' (Low share - High positive trends) and 'Developing destinations with low prospects in tourism development' (Low share - Negative trends) where population density has been declined. The highest increase –as expected- is observed for 'Mature destinations with high tourism dynamic'⁸ (High Share - High positive trends).

Table 8: Degree of urbanization (urban-rural typology) and CO-EVOLVE tourism typology

	High Share - High trends	High Share - Medium trends	High Share - Negative trends
Intermediate Urban (%)	39,29%	50,00%	50,00%
Predominantly Urban (%)	25,00%	40,00%	25,00%
Predominantly Rural (%)	32,14%	10,00%	25,00%
No Data	3,57%	0,00%	0,00%
	Low Share - High trends	Low Share - Medium trends	Low Share - Negative trends
Intermediate Urban (%)	10,00%	14,29%	13,04%
Predominantly Urban (%)	10,00%	0,00%	4,35%
Predominantly Rural (%)	60,00%	85,71%	82,61%
No Data	20,00%	0,00%	0,00%

Eurostat 2011, Own Processing

⁸ See ANNEX, Table 3

In terms of urbanization degree, it is interesting that areas with “high share” are mainly intermediate urban, while the majority of “low share” or “medium share” areas are predominantly rural⁹.

As evidenced, there is a lack of reliable data for all Mediterranean countries and for different administrative levels for the period 1950-2050. More specifically, data availability about trends of urbanization and littoralization is already fairly limited for the European countries and even more for the southern and eastern countries of the Mediterranean basin. Population density and degree of urbanization alone cannot provide a detailed description of how urbanization\littoralization is developing. It is, therefore, very difficult to make comparisons on a national or regional level, especially considering the lack of data integration (Plan Bleu, 2003), or estimate future trends. A database with environmental and economic indicators (e.g. land uses, soil sealing, rate of all types of economic activities etc.) for both European and non-European countries and for lower administrative levels (NUTIII or LAU) is needed in order for the phenomenon to be studied in a holistic and integrated way. For instance, the effective use of indicators such as EcAp EO8 indicators on Coast could contribute significantly to filling this gap, providing a clear picture about coastal ecosystems and landscapes.

2.3 Urbanization in the North Mediterranean Countries¹⁰ – state of the art

SPAIN

Spain is among the most urbanized countries of the Northern Mediterranean. This is evident from the statistic data which shows that: a) 20% of the Spanish shoreland is occupied by urban entities, b) 29 urban areas in the coastal zone have a high urban development index and c) 80% of coastal urban areas are implicated in ICZM actions. In 2014, 56% of the population (over 20 million people) resided in coastal urban zones. However, coastal urbanization is not equally intensive among Spanish coastal areas as the South and East are completely occupied by urban areas, in contrast to the north coast which is less urbanized (De Andrés et al., 2017). Due to coastal urbanization/littoralization, degradation of coastal ecosystems and land transformations are observed. Especially for countries, such as Spain, where tourism is one of the main economic activities, the building rate for tourist resorts and second homes is very high (El-Kholy et al., 2012). Regarding

⁹ See ANNEX, Table 2

¹⁰ Detailed analysis on the MED eastern – southern rim cannot be developed due to the lack of reliable data.

policy and planning issues, it should be noted that the deficient management model for coastal areas (De Andrés et al., 2017) combined with the Urban Planning Regulation Law (LRAU), which allows land to be confiscated in order to "urbanize" rural areas (De Aenlle and Int. Herald Tribune, 2003), complicates the protection of coastal ecosystems and the sustainable development of these areas.

ITALY

Coastal Urbanization in Italy is intertemporally increasing. Between 2001 and 2012, population trends increased up to 5% (EEA, 2013). Littoralization and the subsequent urban sprawl have long been considered as one of the causes of urban functional disorganization, in terms of the use of services and transport efficiency (Fiorini, 2016). The national framework related to sustainable urbanization is considered as neither comprehensive nor homogenous as there are regions with experience in the use of integrated assessment procedures in urban development planning and others which adopt only general instruments without taking into account the contemporary changes in the urbanization process (ECOSOC, 2014a).

FRANCE

France, similarly to Spain, is a highly urbanized country with a densely populated coastline. According to the projections provided by UN (2014), by 2050 its urban population will have exceeded 85%. This pattern is also encountered in coastal areas. For instance, population trends in French coastal regions from 2001 to 2012 increased considerably and over 5%.

CROATIA

During the last thirty years, the Croatian population depending on agricultural resources and production has been decreasing (Grgic et. al, 2010), while the proportion of urban population is continuously increasing and is expected to exceed 70% by 2050 (UN, 2014). In coastal areas, where population increases considerably during the summer because of tourism activity (El-Kholy et al., 2012), urbanization is not as intensive as in other Mediterranean countries (e.g. France, Malta) (Pranzini et al., 2015). Regarding the policy framework, it is not considered adequate, however ICZM initiatives could be supported by existing sets of instruments related to spatial planning, such as urban areas sanitation plans, transportation, communal and other infrastructure (ECOSOC, 2014b).

SLOVENIA

Slovenia's urbanization rate is among the lowest compared to other European Mediterranean countries (UN, 2014). The Slovenian urban system never achieved a high level of urbanization; in fact, a short period of urbanization was followed by a slowing down of the growth of urban population (Ursic, 2012). However, it is characterized by high

urbanisation, as more than 80% of the Slovenian coastline is urbanized and mostly within 1.5km from the coastline (El-Kholy et al., 2012).

CYPRUS

Cyprus is a highly urbanized country with a total urban population growth reaching 46%. As statistics show, coastal urban growth is 55% (the urban growth of the hinterland is 35%), while coastal rural growth is 45% (the rural growth of the hinterland is 8%). Its development pattern is polarized. There is a strong littoralization, on the one hand, and, on the other hand, depopulation and abandonment of the hinterland jeopardizing its economic vitality and social cohesion. Coastal zones are the areas where 50% of the total population lives and works (about 67% of non-agricultural jobs are concentrated in coastal cities) and 90% of tourism industry is located (about 95% of tourism accommodation is located in the urban coastal cities and the smaller tourism settlements) (Coccossis et al., 2008).

MALTA

Malta is the most urbanized country of the Mediterranean basin (among European, Middle-East and African countries). Urbanization has expanded mostly around the coast; Malta has a coastline of 190 km, 43 % of which is heavily utilized (El-Kholy et al., 2012). The island has an intense and diverse use of coastal land use ranging from towns, villages, recreational areas, harbors, military land use and industrial and servicing areas (Biolchi et al., 2014). The built-up areas comprise 24 % of the coast which entails a very high population density (1,300 persons/km²) (El-Kholy et al., 2012). The southern part of Malta is the most urbanized as the majority of human activities and consequently the major environmental problems are concentrated there (El-Kholy et al., 2012).

GREECE

Greece has the most extensive coastline (a length of approximately 15,000 km) among all Mediterranean countries and a large number of islands (Coastal Wiki, 2007). The total urbanized coastal area is estimated at 1,315 km², which represents 1.31% of the country's total surface area (Sakellariou et al., 2011). These areas host 50 % of the country's population and the majority of the industrial activity (El-Kholy et al., 2012). The population density is estimated at 88 inhabitants per km², while the average density of the country is 75 inhabitants per km² (Sakellariou et al., 2011). In the last decades, the coastal zone has encountered continuous deterioration, as a result of increasing pressures for tourism and recreation (development of second houses); urbanization of the coast has caused loss of agricultural land and open spaces, which could also serve as habitat areas and sites for recreation (Coastal Wiki, 2007).

2.4 Drivers, pressures (environmental, economic and social) and impacts on touristic areas

Urbanization, to a greater or lesser extent, shows commonalities in all Mediterranean cities regardless of their geographic, economic or administrative features. The uncontrolled transition from the traditional vertical urban concentration (compact town and suburban agriculture) to a more horizontal, technologically driven city (mixed landscape with commercial, industrial or tourism clusters around cities) is characterizing almost the entire Mediterranean (Plan Bleu, 2013). As mentioned by Salvati et al. (2013), since 1980, Mediterranean cities are characterized by huge expansion. More recently, a growing percentage of rural areas has undergone land use changes due to low density (exurban) development. Therefore, dispersed clusters of residential, commercial and industrial buildings and tourist resorts linked to dense road network are the basic elements of the Mediterranean landscape.

Drivers, pressures or impacts of urbanization may vary from one country to another as well as at regional and local scale within the same country. However, in the Mediterranean as a whole, the **drivers** that led to its current situation range from demographic and social to economic and political and their interrelations. Significant population growth (endogenous urban growth) and, mainly, persisting migration flows from rural areas to urban settlements (rural exodus) are the primary causes of urbanization not only in a Mediterranean level but worldwide. The low productivity of agriculture in the mountainous areas combined with the increased opportunities offered by the economic development in urban areas has led to an increased gap between the living conditions of both areas and to a strong rural urban migration (Secretariat of the Union for the Mediterranean, 2013). Technological development and the consequent changes to lifestyle, namely improvement of living standards and quality of life (educational facilities, housing conditions, health care etc.), constitute cities and towns more attractive. Generally, it could be stated that “modernization” in all fields of life is a basic urbanization driver. Another factor that has contributed considerably to the increase of the urbanization rate, quite intensively in recent years, is the migration crisis that Europe is dealing with, as, in most cases, migrants are housed in large urban centers.

International and local economic factors also play a crucial role in urban population growth. The modification of the economic structure and production systems are equally important. The globalizing economy and the consequent reform of the traditional rural economies in the hinterland have significantly contributed to coastal urban growth in numerous Mediterranean countries (Salvati, 2014). During the industrialization and

commercialization, cities became the locomotive of economic development, and, even more coastal economies shifted their orientation towards the services sector and particularly tourism. Additionally, maritime activities, in general, offer a variety of economic benefits due to the resources and ecosystem services they provide (EEA, 2013). The economic appeal of coastal cities is heightened by the effects of ports and port-related activities as well as coastal attractions (UNU-IHDP, 2015). The rapid development of tourism taking the form of massive development in tourism accommodation and housing, is related to maritime transport (passenger and commercial), one of the most important drivers behind the continuous pressures that contribute to the degradation of the Mediterranean sea and coast (UNEP/MAP, 2012).

All drivers described above that led to the current urbanization rates shaping the landscape of the Mediterranean are ultimately the outcomes of legal or illegal private initiatives¹¹. The complex system of interacting agents (public and private sector, citizens) (informal private action combined with speculative investment behavior) benefited by the lack of a strong and modern regulatory framework. Moreover, the limited effectiveness of planning (e.g. extreme densification of urban environments) coupled with a relatively poor control against land appropriation and illegal actions (Salvati et al., 2013), on the one hand, and the absence of a development policy for rural areas, on the other, abet the uncontrolled coastal urbanization and the subsequent misuse of urban and suburban coastal land (European Commission, 2008).

As it is clear, Mediterranean coasts are an environment that attracts socioeconomic development for many reasons. However, this attractiveness introduces multiple drivers (urbanization is one of the strongest driver) of land use change, which can lead to increased pressures on natural and human environments (Iglesias-Campos et al., 2015).

According to related literature, two general processes of land use change have occurred during the last decades; first, the decline in dry farming and forest use and second the intensification of irrigated crops and the urbanization of coastal plains (Serra et al., 2008). The increase of artificial against natural land has occurred all across the European Mediterranean coast. The changes in land coverage in coastal areas is similar to the change observed at a European level, namely the artificialization is the dominant driver of coastal zone development, mostly at the expense of former agricultural land (EEA, 2013). These changes, as a consequence of human influence on landscape, derived from significant modifications in ecosystems at a local, regional and global scale, influencing

¹¹ A typical example is the vacation houses in the periphery of coastal cities.

many fields (e.g. many fields of economy-aquaculture, fishing, tourism etc.) (La Mela Veca et al., 20016). Human activity is the major cause for intensive land use and land cover changes; the sensitivity of coastal habitats is often jeopardized to make way for housing, industry, agricultural land and infrastructure for tourism and transport (EEA, 2010). These activities and its related infrastructure are concentrated on the coveted coastal areas¹², thus pressures and degradation are increasing, with rapid artificial land cover of coasts. In less than one generation, entire portions of coastal zones have been built-up, causing irreversible damage to landscapes and losses in habitat and biodiversity (Plan Bleu, 2006). Consequently, land degradation processes that lead to desertification mainly emerging from conflicts between past and present land uses, or between economic and ecological priorities (Hill et al., 2008) affect large areas of the European Mediterranean. According to European Environment Agency-CORINE Land Cover Data (2013), land use/cover changes and particularly changes from other uses (e.g. from agricultural areas, forest and semi-natural areas, wetlands or water bodies) to artificial areas in the Mediterranean countries from 1990 to 2012 are remarkable. In all of the three periods (1990-2000, 2000-2006, 2006-2012), about 75% of the areas that became artificial were previously agricultural land, while almost 25% were forests and semi-natural areas.

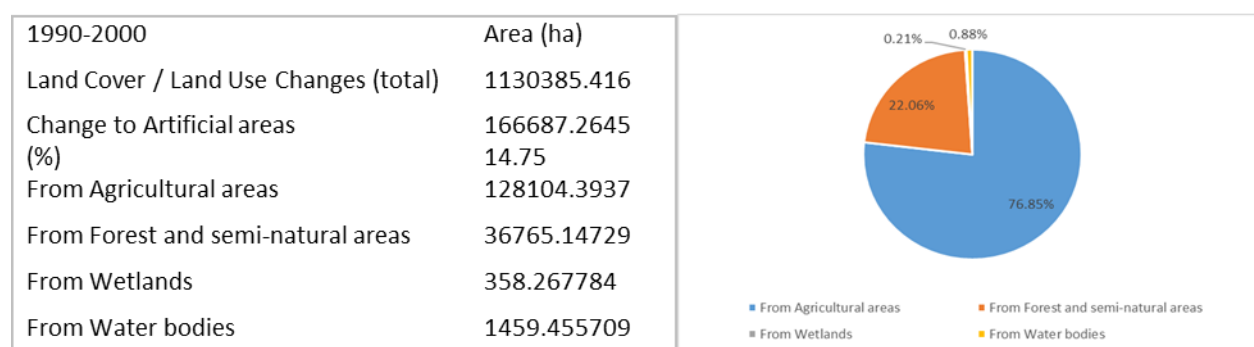


Figure 7: Land Cover/Use Changes in artificial land, 1990-2000

EEA 2013, Own Processing

¹² In 2000, there were 70 million urban inhabitants, 584 coastal towns, 175 million tourists, 750 yacht harbours, 286 trade ports, 248 energy plants, 238 desalinization plants, 112 airports and numerous high-traffic roads (Plan Bleu, 2006).

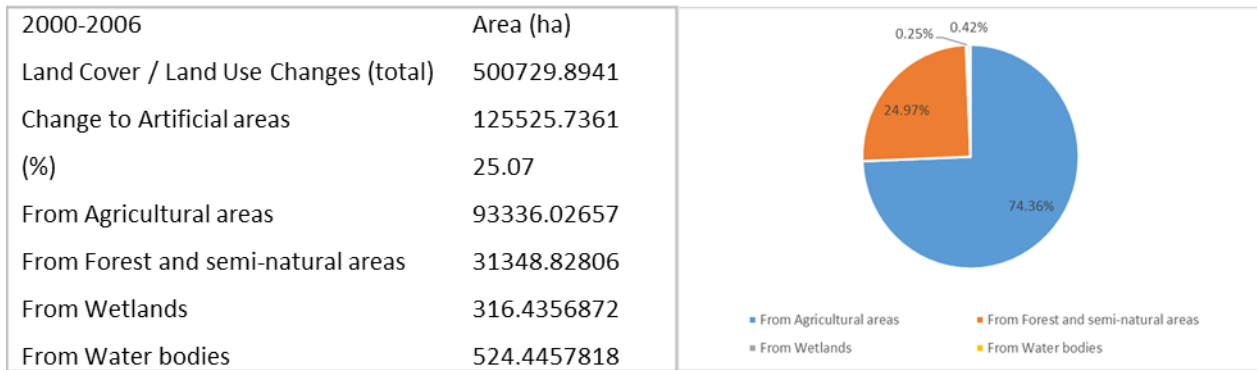


Figure 8: Land Cover/Use Changes in artificial land, 2000-2006

EEA 2013, Own Processing



Figure 9: land Cover/Use Changes in artificial land, 2006-2012

EEA 2013, Own Processing

Focusing on coastal areas (10 km zone from the coastline) the changes are similar, meaning that the hinterland and coastal areas are characterized by similar pattern and trends of artificialization.

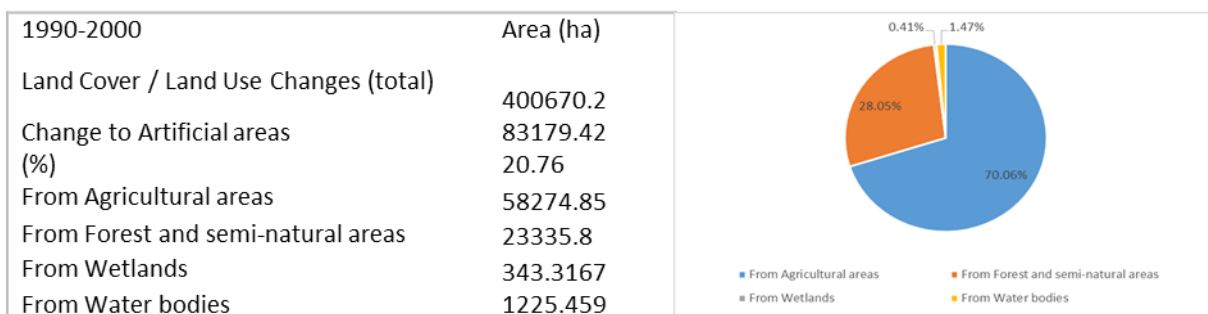


Figure 10: Land Cover/Use Changes in artificial land in 10km zone from the coast, 1990-2000

EEA 2013, Own Processing

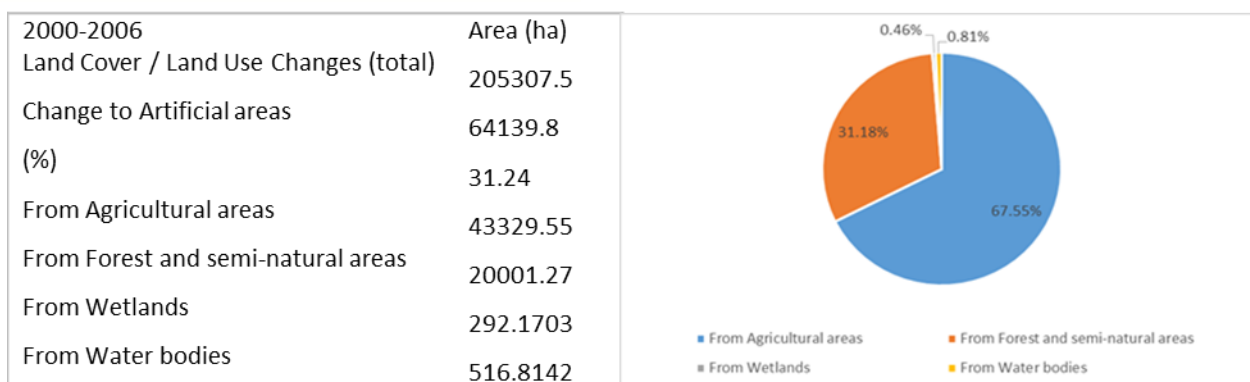


Figure 11: Land Cover/Use Changes in artificial land in 10km zone from the coast, 2000-2006

EEA 2013, Own Processing

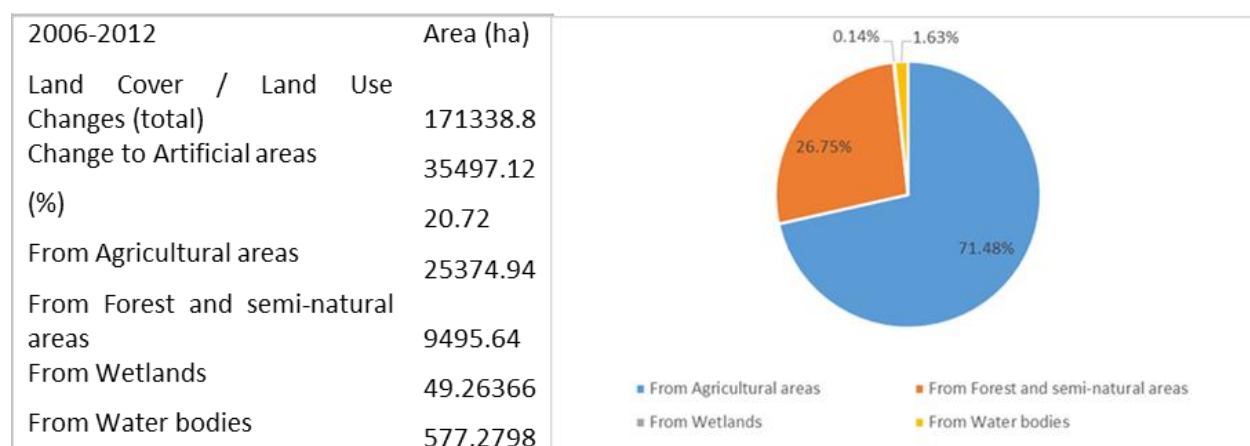


Figure 12: Land Cover/Use Changes in artificial land in 10km zone from the coast, 2006-2012

EEA 2013, Own Processing

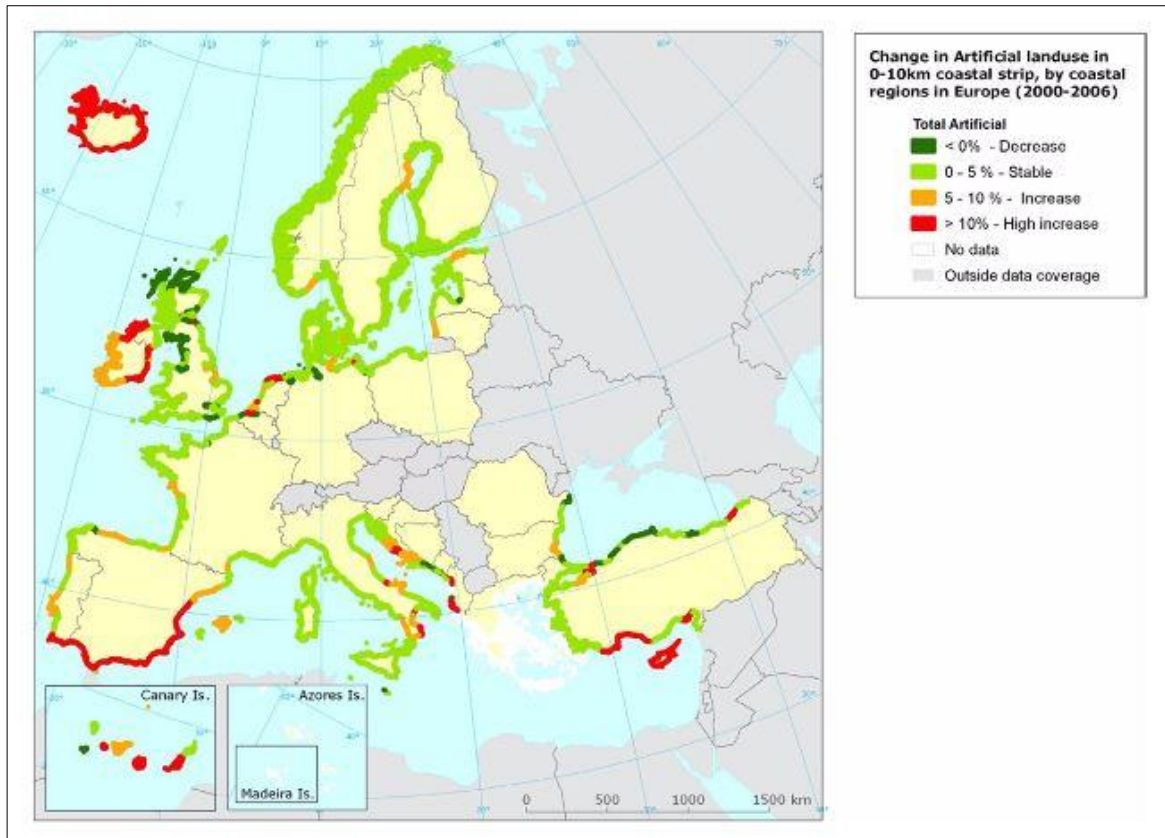


Figure 13: Change in artificial land use in 0-10 km coastal strip, by coastal regions in Europe (2000-2006)

EEA, 2013

The highest percentage (31%) of artificialized land is observed between 2000 and 2006, while before and after this period the same percentage was lower (20.76% and 20.72% respectively). Additionally, Land Cover/Use Changes in artificial land in both coastal and hinterland areas came from mainly agricultural areas (about 67-77%) and to a lesser degree from forest and semi-natural areas (about 23%).

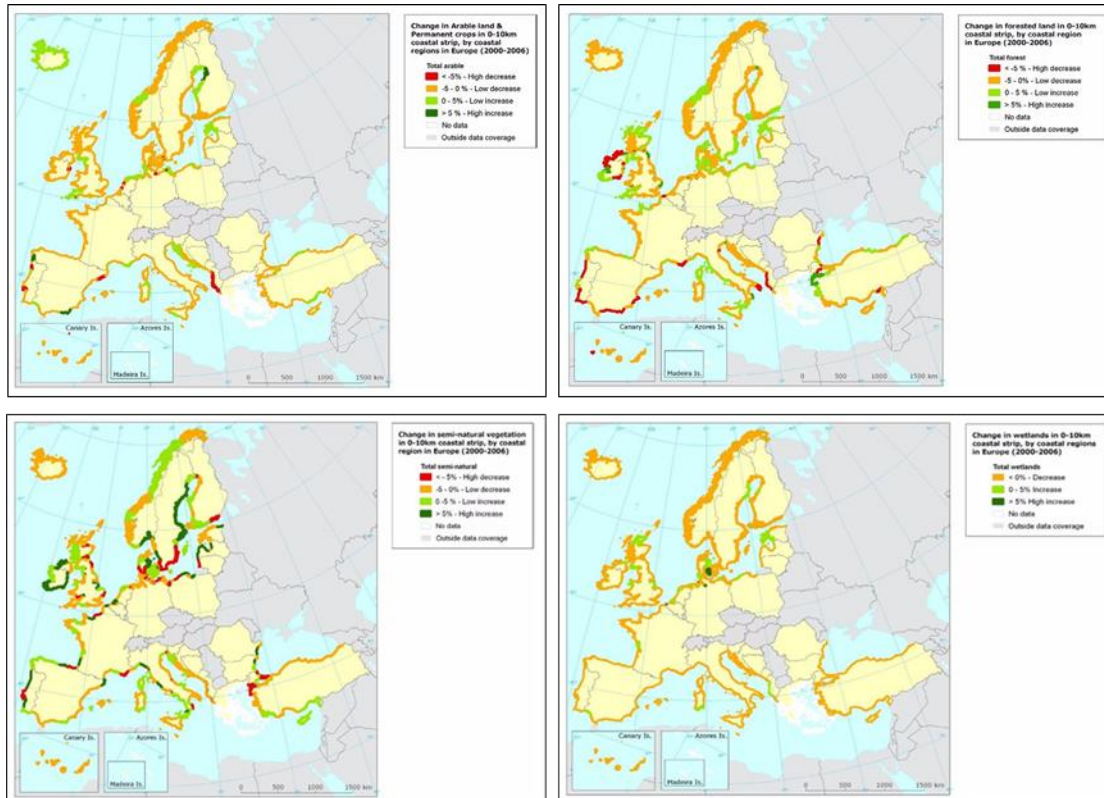


Figure 14: Change in arable land, forested land, semi-natural vegetation and wetlands in 0-10 km coastal strip, by coastal regions in Europe (2000-2006)

EEA, 2013

As it is obvious, coastal areas, apart from the opportunities they offer, they can also be characterized as places of risk due to the environmental, economic and social impacts.

The main environmental impacts of urbanization in coastal areas can be summarized in pressures on landscape and ecosystems and the degradation of natural resources. Increased urbanization and the related land use change has caused multiple impacts, including habitat loss, reduction of freshwater and sediment discharges by rivers, salinization of coastal aquifers, soil and coastline erosion and eutrophication of coastal waters. These impacts threaten natural and cultural landscape integrity and diversity in the region, altering the fine-grained and multifunctional landscape and limiting options for sustainable development (UNEP/MAP, 2012). According to EEA (2013) assessment of the marine and coastal ecosystems, many of their vital functions have weakened, impairing the overall ecosystem health. Analytically¹³:

¹³ Data mostly retrieved from European Environmental Agency (2016) Urban Sprawl in Europe – Joint EEA-FOEN Report, (2006) Urban sprawl in Europe - The ignored challenge and (1999) State and pressure of the marine and coastal Mediterranean environment.

- Impacts on land, and specifically on land use and geomorphology, include significant loss of natural areas (e.g. agricultural land, farmlands, forests, vegetation etc.) and highly fertile soil, degraded quality, soil erosion, soil compaction, soil sealing, stabilization of slopes and desertification because of the growing artificialization.
- Landscape is affected through three main processes: transformation, degradation and fragmentation. The most significant impact, depending on the degree of urbanization, is the increasing penetration of the landscape by built-up areas.
- Impacts on climate concern the microclima modification and its effect, known as “heat island effect”, and modification of climate conditions (e.g. variability in temperature, humidity or moisture).
- Impacts on energy, namely the increase of the environmental footprint, get higher over the years in urban areas due to the uncontrolled population concentration, tourist and industrial activity and transport.
- Pollution is traditionally a common phenomenon in Mediterranean coasts with various dimensions and often with harmful aftereffects for air, water, sediments and biota.
- Urbanization impacts on water systems and hydromorphology include mainly alterations of watersheds as a result of the reduction of the quantity and quality of groundwater, diminished hydrological dynamics of wetlands around cities, modification of surface water course.
- There are impacts on the dynamics and the maintenance of the Mediterranean biodiversity; a number of coastal habitats and species are at risk. A serious consequence of habitat degradation is the loss of species or 'ecological extinctions' of local population from complex ecosystems.

Summarizing, intense human activity is behind the main pressures in Mediterranean coasts. Dense coastal population, urbanization and activities such as tourism, industry, fishing and aquaculture are immediate drivers of environmental pressures. Urbanization in combination with these activities and especially with tourism¹⁴ has interactions with the environment that are obvious in the whole MED area. According to Med-IAMER project (2015), for Western Mediterranean ecoregion, the main pressures are soil sealing and smoothing, marine litter and introduction of non-synthetic substances and compounds,

¹⁴ The Mediterranean is the world's leading tourist destination, accounting for 30% of international tourism and one third of international tourism (EEA, 1999).

while soil sealing, release of organic matter in coastal and marine waters, source of heavy metals and eutrophication in the Adriatic Ionian ecoregion. However, analyzing the geographical distribution of these impacts in a lower level in order to understand the environmental status of NUTS III coastal areas is really difficult due to lack of available information.

Coastal areas can support effectively and without considerable conflicts only a certain amount of activity. Due to the expansion of different human activities, coastal zones have accommodated a number of different uses in space and time, often lacking long-term coordinated spatial planning, including maritime zones (Iglesias-Campos et al., 2015).

Salvati (2014) states that, for the Mediterranean coastal areas, the consequences of urbanization/littoralization and urban sprawl on the natural and built environment can be summarized in the loss of agricultural and natural land, the disappearance of wetlands, coastal erosion, destruction of highly valuable natural habitats, degradation of urban lifestyle, increase cost of urban infrastructures and intensification of the effects of natural disasters in urbanized areas.

In addition, the economic consequences¹⁵ of urbanization are important. Although urbanization is thought as an indication of urban growth, many times, it is accompanied by phenomena such as increase of living costs or unemployment and exacerbating economic and social divisions. In particular:

- Migration from rural to urban areas, known as rural exodus, has altered the structure of the production system by weakening the primary sector and enhancing the services sector. The concentration of workforce in the tertiary sector is a cause of increasing unemployment rates of urban population, especially in medium-sized cities (e.g. Greece, Italy).
- Urban expansion means drastic reduction of agricultural land and consequently reduction of food production and dependence on imported food. This trend does not only strengthen the exploitative relation between urban and rural areas but also the dependence on other countries with more developed agri-food sector.
- A potential risk comes from the saturation or environmental degradation of tourist areas that may induce remarkable economic loss.
- Increase of urban population results in lack of adequate housing which in turn leads to price raising. "Housing bubbles" that arose before financial crisis (e.g. in Spain) is

¹⁵ Data mostly retrieved from European Environmental Agency (2016) Urban Sprawl in Europe – Joint EEA-FOEN Report, (2006) Urban sprawl in Europe - The ignored challenge

an illustrative example in EU Mediterranean countries. In the southern part of the Mediterranean problems about housing are related mostly to poor living conditions. In general, the mass migration towards the major urban centres in the region has overstrained the labour and housing markets and the associated public services (EEA, 1999).

- The contrast between crowded with –usually- low quality (because of pollution, congestion etc.) urban centers and the suburban areas causes housing price fluctuations by which the speculative property market is benefited.
- The higher demand of infrastructure and the growing traffic congestion in urban areas is associated with higher costs for transport.

Social impacts¹⁶ of urbanization concern the opportunities urban population may deploy. These opportunities vary from education and labor market to recreation, which, in rural areas, is surely limited. In addition, urban centers reap the benefits of better governance systems and services while bad environmental conditions (e.g. air and noise pollution) in urban areas, especially in metropolitan areas, may have negative effects on public health. It is worth noting that the assessment of environmental or socio-economic status is aggregated and, for this reason, isolating individually urbanization impacts per country or lower administrative level is difficult. Moreover, data (especially quantitative) for urbanization impacts per country or NUTS III areas for all Mediterranean countries are either limited or nonexistent.

¹⁶ Data mostly retrieved from European Environmental Agency (2016) Urban Sprawl in Europe – Joint EEA-FOEN Report, (2006) Urban sprawl in Europe - The ignored challenge

3. *Littoralization & Urbanization addressed by the legal and policy framework*

European & Mediterranean context

The main policies in the Mediterranean are promoted by UNEP/MAP and the European Union whose agendas include issues that are directly or indirectly connected to urbanization processes in coastal areas. Yet, there is not any strategy exclusively related to urbanization. The main framework documents related to this process or to its impacts are:

- The Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (1995): The Barcelona Convention.
- The European Landscape Convention (2000) about the protection, management and planning of European landscapes and the organization of European co-operation on landscape issues.
- The LEIPZIG CHARTER on Sustainable European Cities (2007) which adopts common principles and strategies for urban development policy.
- The Protocol on Integrated Coastal Zone Management (2008) which establishes a common framework for the integrated management of the Mediterranean coastal zone and shall take the necessary measures to strengthen regional cooperation.
- The Marine Strategy Framework Directive (2008) establish a framework for community action in the field of marine environmental policy.
- The Roadmap to a Resource Efficient Europe (2011) which outlines how we can transform Europe's economy into a sustainable one by 2050.
- EU Strategy on adaptation to climate change (2013) strengthening Europe's resilience to the impacts of climate change
- EU Urban Agenda (2016) ensuring maximum utilization of the growth potential of cities and to successfully tackle social challenges.
- UN New Urban Agenda (2016) (Habitat III) an action-oriented document which will set global standards of achievement in sustainable urban development, rethinking the way we build, manage, and live in cities through drawing together cooperation with committed partners, relevant stakeholders, and urban actors at all levels of government as well as the private sector.

National context

To a different extent, all Mediterranean countries have developed a strategy or measures to protect their coastal areas¹⁷. According to Pegaso project Report (2014), seven countries have approved national legislation for Integrated Coastal Zone Management or a Coastal Law and in six countries, such legislation is in the process of being drafted or approved. The remaining countries have laws on spatial planning, integrated water management, natural resource management, or environmental protection, etc., which cover the coastal zone and, to a greater or lesser extent, are in accordance to ICZM principles. Some countries, such as Greece and Croatia, are adapting existing instruments to deal with coastal planning and management issues, or have spatial development plans that include the coastal zone, but do not treat it as a distinct entity.

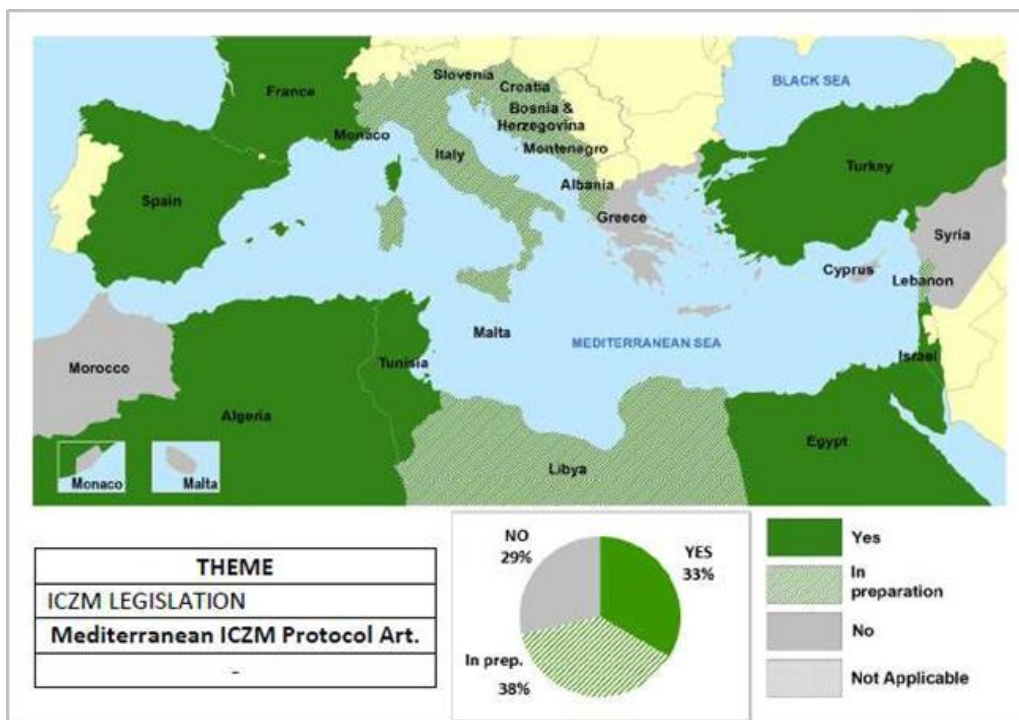


Figure 15: Countries where national legislation for Integrated Coastal Zone Management or a Coastal Law has been approved

Pegasoproject Report, 2014

¹⁷ See ANNEX, Table 4.

However, all the initiatives have been inadequate to establish a sustainable development framework for coastal areas. In UNEP/MAP report (2009), it is mentioned that strategic initiatives that would include integrated approach to spatial notion of coastal zone, sectoral and administrative co-ordination and efficient participation have developed, but the need for better coordination remains. The main characteristics of the Mediterranean legal framework is that there is administrative separation between land and the sea that creates insufficiencies in sustainably managing coastal areas and inadequacy of institutional and sectoral coordination.

The maps below show which countries and to what extent have established measures of institutional coordination at the national, regional and local levels for the purposes of ICZM:

- between the land and marine parts of the coast (figure 14).
- horizontally between different services and other organizations at the same administrative or geographical level (figure 15)
- vertically between different services and other organizations at different administrative or geographical levels (figure 16)

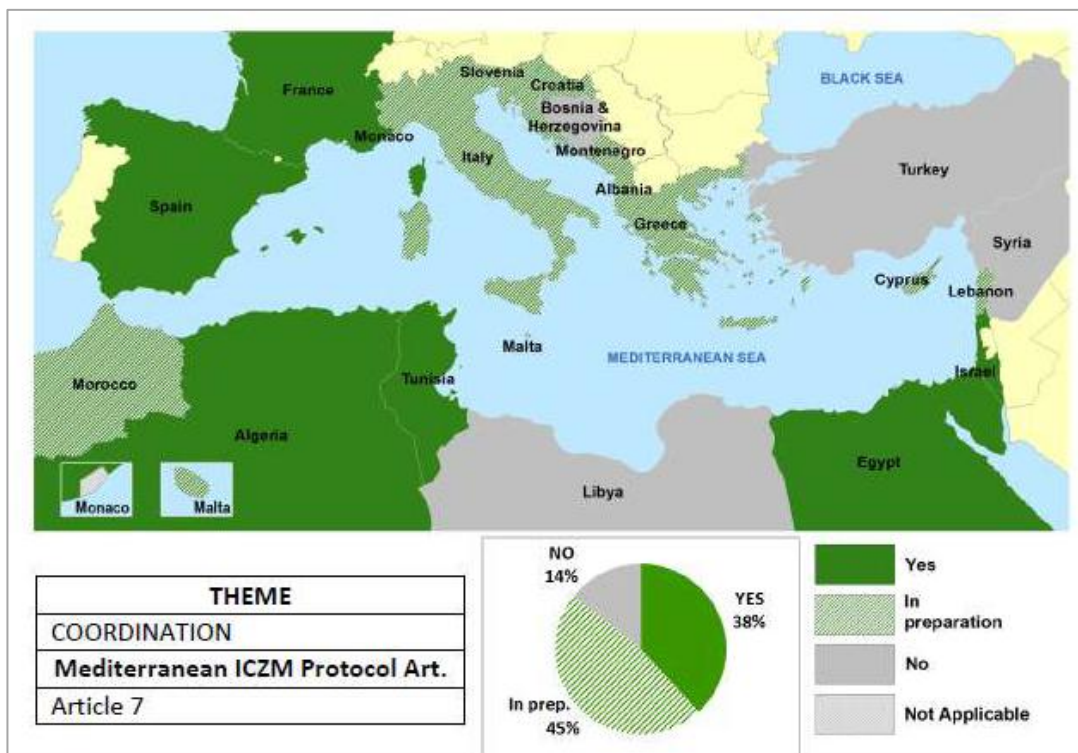


Figure 16: Established mechanisms for ICZM in Mediterranean countries (between land and sea)

Pegasoproject Report, 2014

Mechanisms for coordination between the land and marine parts of the coast are met in six countries, while eleven countries' mechanisms are "in preparation". Where coastal and maritime areas are not yet under the same coordinating body, comprehensive or partial ICZM programmes tend to be set. Identifying how activities on land affect the condition of the sea and how reciprocally, activities at sea affect the land and intertidal areas is essential for coastal management (Pegasoproject, 2014).

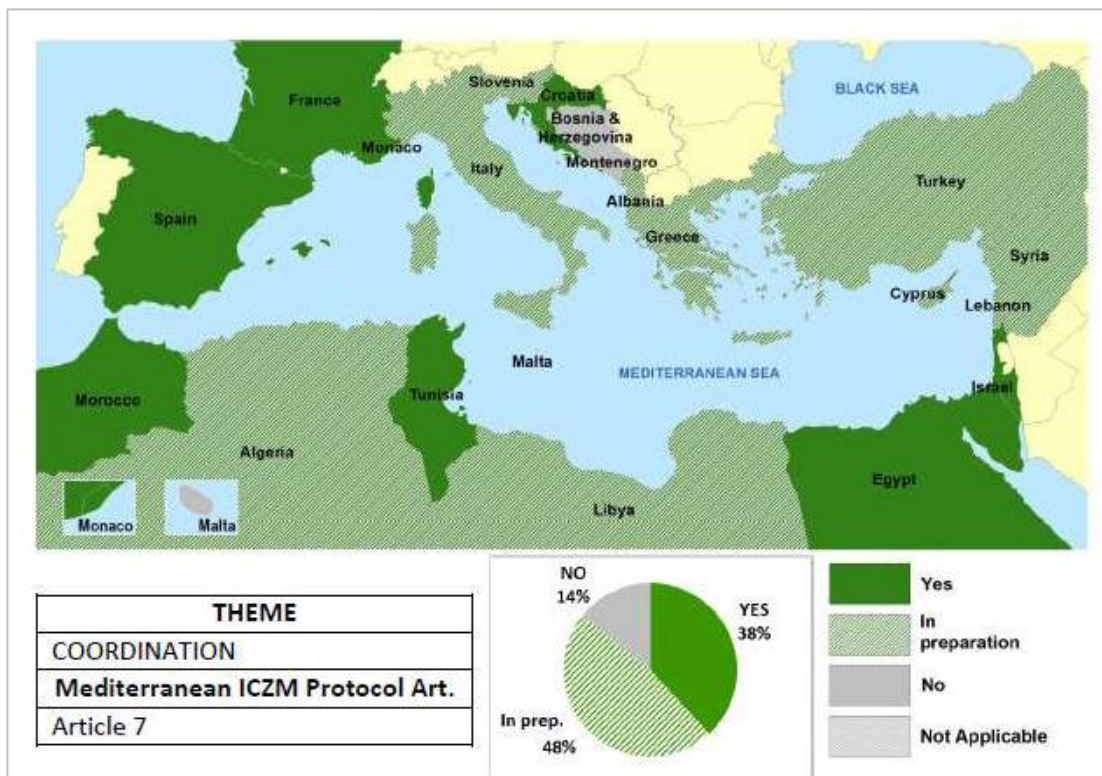


Figure 17: Established mechanisms for ICZM in Mediterranean countries (horizontally)

Pegasoproject Report, 2014

Mechanisms for horizontal coordination (in eight countries) or in preparation (in eleven countries) vary from formal inter-ministerial committees or fora to ad hoc management structures for specific geographical or protected areas. In countries with inter-ministerial coordination, regional or sub-regional examples flourish as well. Therefore, horizontal national level coordination tools prompt local endeavors. (Pegasoproject, 2014).

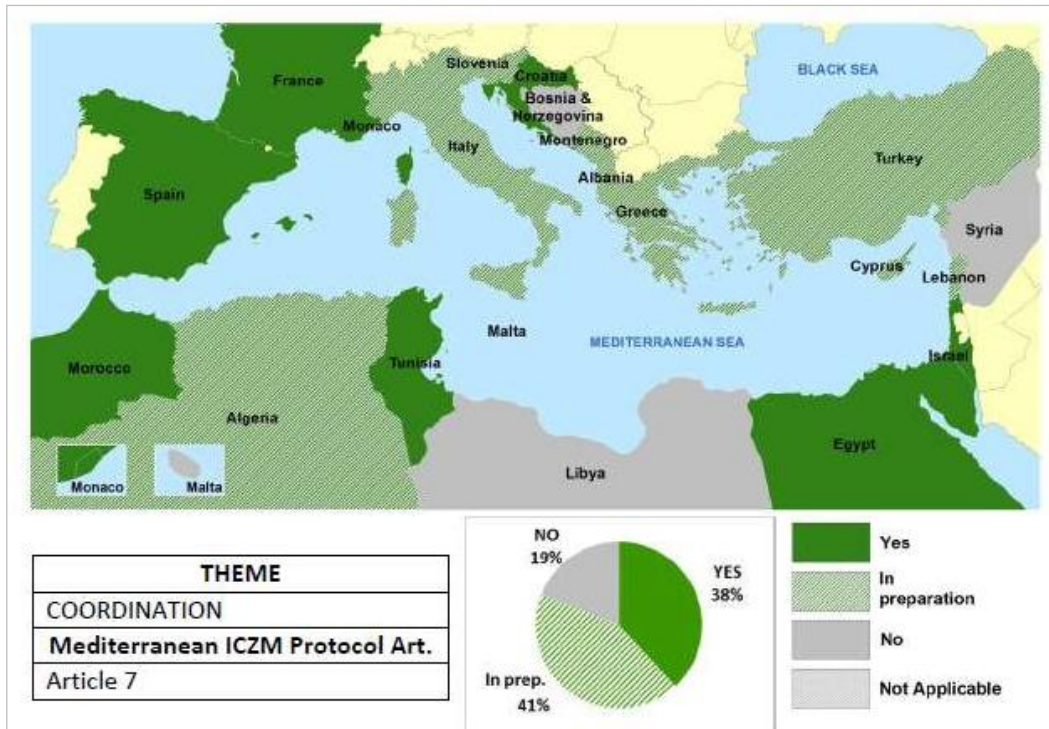


Figure 18: Established mechanisms for ICZM in Mediterranean countries (vertically)

Pegasoproject Report, 2014

Countries that have established formal horizontal coordination mechanisms usually have prepared (or are preparing) vertical mechanisms between different services and other organizations at different administrative or geographical levels - under the same legal structure. A number of states refer to partial mechanisms involving only regional-local structures, or for specific coastal areas. Countries preparing, implementing or operating vertical coordination mechanisms all recognize informal coordination processes. Where vertical coordination mechanisms for ICZM purposes do not yet exist, but the ICZM process is initiated, ad hoc sectoral institutions are to be found for specific coastal issues (Pegasoproject, 2014).

The ICZM Protocol includes provisions in order issues mentioned above to be addressed. The common definition of the Coastal Zone¹⁸ (Article 3) constitutes a legal basis for facilitating integrated management. In addition, the Parties of the Protocol, in order to achieve the protection and the sustainable use of the coastal zone, “*shall establish in coastal zones, as from the highest winter waterline, a zone where construction is not*

¹⁸ The area to which the Protocol applies is defined as “(a) the seaward limit of the coastal zone, which shall be the external limit of the territorial sea of Parties; and (b) the landward limit of the coastal zone, which shall be the limit of the competent coastal units as defined by the Parties”.

allowed. Taking into account, inter alia, the areas directly and negatively affected by climate change and natural risks, this zone may not be less than 100 meters in width. Stricter national measures determining this width shall continue to apply” (ICZM Protocol, Article 8). These provisions may be adapted “for projects of public interest and in areas having particular geographical or other local constraints, especially related to population density or social needs, where individual housing, urbanisation or development are provided for by national legal instruments” (ICZM Protocol, Article 8).

The maps below show which countries and to what extent include measures for protection and sustainable use of the coastal zone in their national legal instruments.

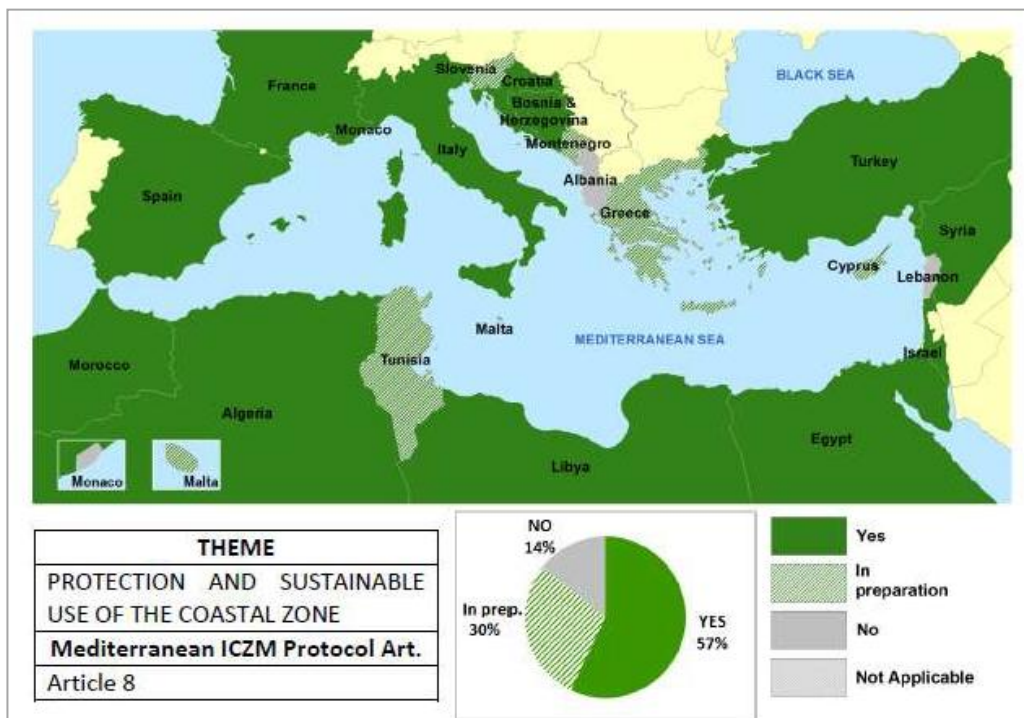


Figure 19: Countries with a law forbidding constructions within a 100-metre strip from the shoreline
 Pegasoproject Report, 2014

In the 12 countries that have a law forbidding constructions within a 100-metre strip from the shoreline, there are certain conditions allowing the exploitation of the public maritime domain. Another 6 countries are either implementing such legislation, or have established smaller zones, typically 25 or 50 metres, where constructions are not allowed, or have binding laws for sensitive selected coastal areas or economic sectors (Pegasoproject, 2014).

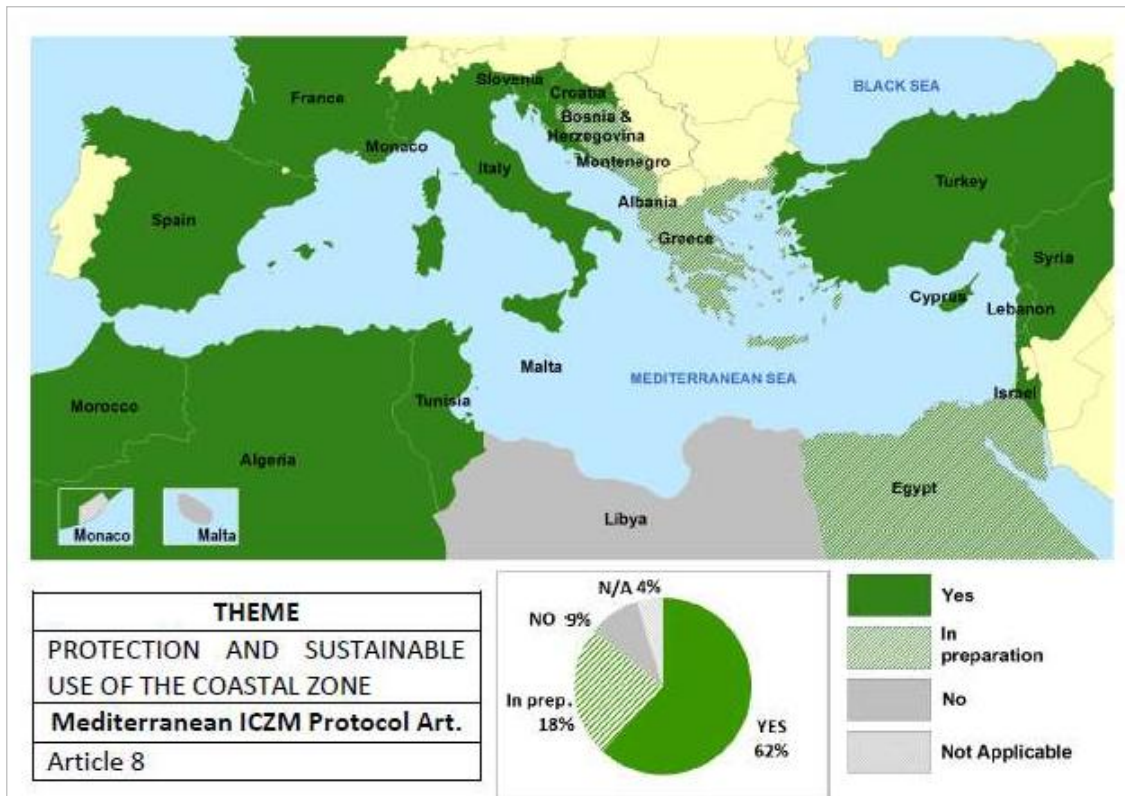


Figure 20: Countries with measures consistent with Article (8) of the Protocol
 Pegasoproject Report, 2014

Thirteen Mediterranean countries have other existing measures consistent with Article (8) of the Protocol and five countries have partially extended legal tools through, for example, national strategies for sustainable development. In developing directions for national territorial planning and sustainable development, the Mediterranean countries in general correspond to the Protocol. Measures that have been adopted across the Mediterranean to enhance the protection and the sustainable use of the coasts through spatial planning provide restrictions to maritime transport, urbanisation and tourism development, tackling biodiversity loss, pollution risk, etc. (Pegasoproject, 2014).

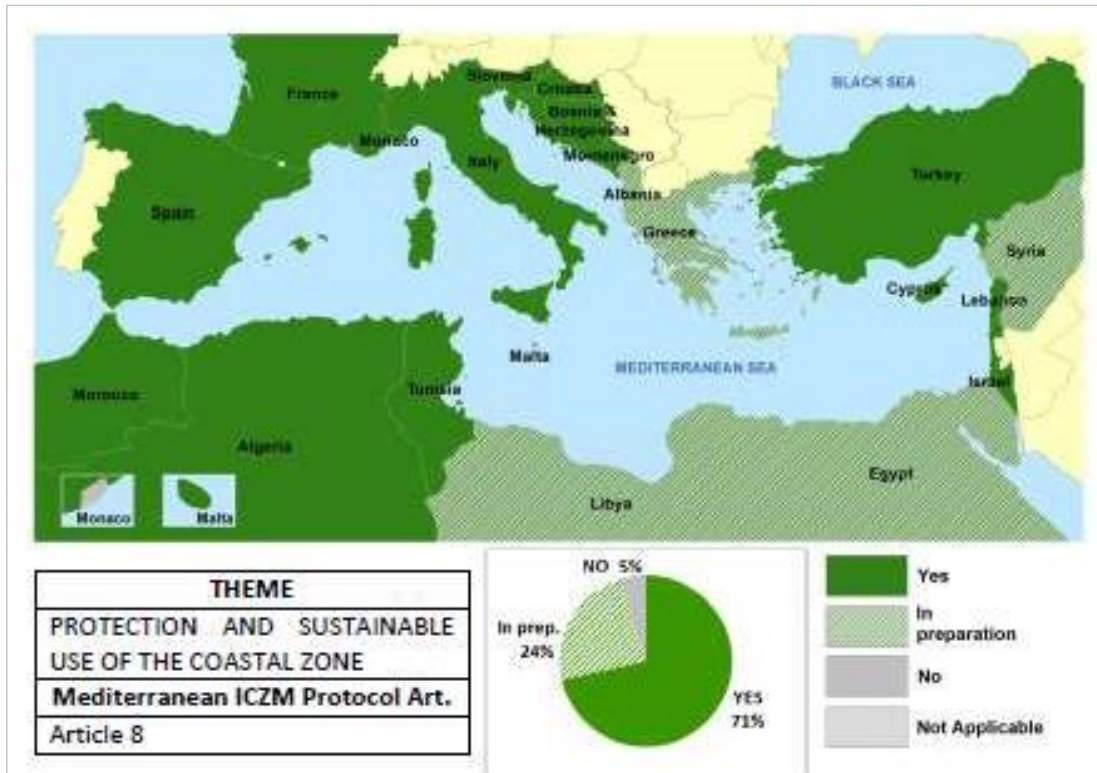


Figure 21: Countries with delimited areas where urban development and other activities are restricted or prohibited

Pegasoproject Report, 2014

Urban development is subject of restrictions for fifteen countries, while only five countries do not have comprehensive restrictions. The restrictions vary from limitations, mainly for the industrial and tourist sectors, to the prohibition of development in protected areas. In other cases, the limitation concerns specific activities, such as soil or underground resource exploitation. The definition of areas of special interest, where urban development is restricted, depends on the national strategies and plans for specially protected areas, and for strategic economic activities of public interest, natural parks, cultural heritage, green zones (pegasoproject, 2014).

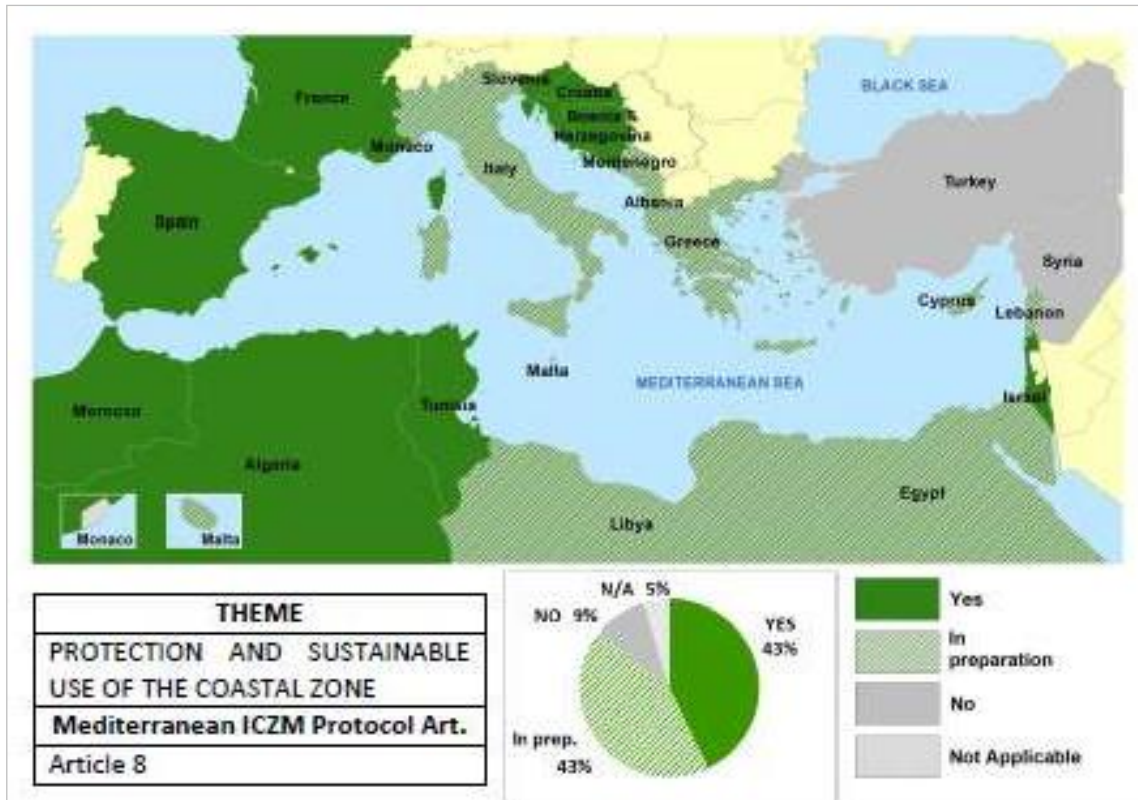


Figure 22: Countries with limited linear extension of urban development and the creation of new transport infrastructure along the coast

Pegasoproject Report, 2014

Although linear urban expansion and the development of new transport infrastructure are both widely considered, only 9 countries have legal frameworks consistent with the Protocol requirements (9 countries “in preparation”). Most countries may have regulations limiting linear urbanisation but not yet on transport infrastructure, or vice versa (Pegasoproject, 2014).

4. *Assessment of Littoralization & Urbanization through EcAp indicators*

The **Ecosystems Approach (EcAp)**¹⁹ is a strategy for the integrated management of land, water and living resources that promoted conservation and sustainable use in an equitable way. The Parties to the Barcelona Convention have engaged into a process to implement the ecosystems approach in the Mediterranean the ultimate objective of which is to influence the management of human activities. The Ecosystem Approach goes beyond examining single issues, species, or ecosystem functions in isolation. Instead, it recognizes ecological systems for what they are: rich mixes of elements that interact with each other continuously. This understanding is particularly important for coasts and seas, where the nature of water keeps systems and functions connected (EcAp-MED, 2012).

The main value added of the EcAp, in the context of the Barcelona Convention, is a renewed emphasis on implementation and integration that will strengthen the ability to understand and address cumulative risks and effects as well as to better focus the actions on priority targets. Simply put, the EcAp brings MAP's many sectoral analyses and management measures into a single integrated framework which will result in an adaptive management strategy that will be periodically monitored, evaluated and revised through a rigorous six-year (2012-2018) first Management Cycle (RAC/SPA, c2017).

EcAp includes a list of common indicators, which form the basis of the Integrated Monitoring and Assessment Programme (IMAP) (UNEP/MAP, 2016a). In the context of the Barcelona Convention, a **common indicator** is an indicator that summarizes data into a simple, standardized and communicable figure and is ideally applicable in the whole Mediterranean basin, at least on the level of sub-regions, and is monitored by all Contracting Parties. A common indicator is able to give an indication of the degree of threat or change in the marine and coastal ecosystem and can deliver valuable information to decision makers (UNEP/MAP, 2016a). Apart from the common, there are also **candidate indicators**. Candidate indicators are those that still have many outstanding issues regarding their monitoring and assessment and therefore are recommended to be monitored in the initial phase of IMAP on a pilot and voluntary basis (UNEP/MAP, 2016b). Common and candidate together number 27 indicators for the 11 ecological objectives (EO).

While most of the EOs are maritime oriented, one EO (EO8) is based on the requirements originating from the geographic coverage of the revised Barcelona Convention and the

¹⁹ The application of the EcAp decided at the Meeting of the Contracting Parties to the Barcelona Convention - COP15 in 2008.

ICZM Protocol, as well as the LBS (Land-Based Sources) Protocol (PAP/RAC, 2015); it is EO8 on Coast about coastal ecosystems and landscapes which emphasizes the integrated nature of the coastal zone, particularly through consideration of maritime and terrestrial parts as its constituent elements (UNEP/MAP, 2016a). EO8 has two operational objectives:

- “8.1 The natural dynamic of coastlines is respected and coastal areas are in good condition” referring to coastal erosion (UNEP/MAP 2016a).
- “8.2 Integrity and diversity of coastal ecosystems, landscapes and their geomorphology are preserved” referring to the integrity of coastal ecosystems, which is, essentially, expressed through the issue of coastal landscapes (UNEP/MAP, 2013 cited by UNEP/MAP 2016a).

Furthermore, EO8 includes two indicators:

- common indicator 16: “Length of coastline subject to physical disturbance due to the influence of man-made structures²⁰” and
- candidate indicator 25: “Land use change” (UNEP/MAP 2016a).

The monitoring aim of the EO8 common indicator is twofold: (i) to quantify the rate and the spatial distribution of the Mediterranean coastline artificialization and (ii) to provide a better understanding of the impact to the shoreline dynamics. It has an operational target on impact, thus it is associated to concrete implementation measures related to specific human activities (i.e. appropriate management measures) to minimize negative impacts and to inform about progress towards Good Environmental Status (GES) (UNEP/MAP 2016a).

According to the Decision IG. 22/7, monitoring under EO8 is meant to address human activities that cause coastal artificialisation through sealing the coast with the implementation of coastal structures²¹ and therefore affect coastal ecosystems and landscapes. As there is hardly any available data about the status of Mediterranean coasts (effects due to littoralization) per country or in a wider basis, these indicators are very useful in order to fill the gap of systematic monitoring and assessment and therefore to contribute to the shaping of legislation about coastal areas.

²⁰ The term ‘manmade structures’ typically refers, solely, to coastal defenses and ports (and indirectly to land claim). Coastal segments are “artificialized” when all or part of the 100-meter area on both sides (i.e. land and sea) are subject to transformation by Man, modifying their original physical state (Decision IG. 22/7).

²¹ The types of structures included by the term ‘manmade structures’ are hard coastal defence, ports and marinas, land claim, impervious surface in the hinterland (UNEP/MAP 2016a).

Assessment

Concerning the assessment of the common indicator 16, there is a need of a definition of thresholds, such as minimum and maximum percentage (%) and/or minimum and maximum length (m), to be developed, during the initial phase of IMAP. This should be based on expert assisted procedure taking into account the typology of the coast including the ecosystem goods and services related to social and economic benefits. The assessment should also include disturbance that comes from such structures (Decision IG. 22/7).

In relation to candidate indicator 25 on land use change, Contracting Parties are encouraged to develop monitoring programmes and undertake monitoring activities in line with the outcomes of the EcAp-MED pilot project, undertaken in the Adriatic. This indicator is very important for the analysis of processes (including land-sea interaction) in coastal areas and, as it is a simple tool, it should be promoted and developed during the initial phase of IMAP. This will allow countries to propose adequate measures to achieve GES taking into account their local specificities. It will bring more objectivity into reporting on the state and evolution of their coastal zones and implementation of the ecosystem approach in coastal zones. During the initial phase of IMAP implementation, further work is expected to be undertaken to provide support to the Contracting parties through training, capacity building activities, exchange of experience including consultations at sub-regional level (Decision IG. 22/7).

Monitoring

The monitoring of the coastal common indicator entails an inventory of:

- the length and location of manmade coastline,
- the surface area reclaimed from the 1980's onward (ha)
- the surface impervious area in the coastal fringe (100m from the coastline).

Therefore, monitoring should focus, in particular, on the location, the spatial extent and the types of coastal structures. Additionally, in those sandy coastal segments where manmade structures have been identified, the shoreline evolution of the coast will be also monitored in order to analyze the beach response to the presence of manmade structures (UNEP/MAP 2016a).

Due to the strong spatial component of the EO8 common indicator, **space and airborne earth observation systems** are the most suitable tool to conduct the monitoring strategy (UNEP/MAP 2016a). The parameters to monitor can be categorized in those of coastal fringe artificialization and the length of sandy areas influenced by such artificialization. In addition to these parameters, auxiliary data can contribute to the prediction of coastal segments more vulnerable to the physical presence of manmade structures. Physical

disturbance due to manmade structures induce different degrees of impacts according to the nature and particularities of the coastline concerned. Therefore, incorporating these ancillary data could provide robustness to the indicator offering a linkage between monitoring and status assessment needs (e.g. determination of thresholds) (UNEP/MAP 2016a).

Monitoring Methods

Very high resolution (VHR) satellite images outweighs other methods, as they are a cost-effective method capable to provide repeated surveys for large areas and identify specific components of the built environment (UNEP/MAP 2016a). In addition, they are suitable both for the detection of manmade coastline and for the shoreline evolution of sandy areas under physical disturbance (UNEP/MAP 2016a).

UNEP/MAP, through its agenda (2016a), provides information and guidelines about different methods and tools for different uses in monitoring and mapping, data collection, location of sampling sites.

Indicators about coastal ecosystems and landscapes proposed by EcAp can be used as a tool to evaluate the state of Mediterranean coasts. They are highly useful concerning urbanization and its impacts as -until today- data availability is limited.

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6. ANNEX

Table 1: Population density by coastal regions 1990-2013

	1990	1995	2000	2005	2010	2013	1990-1995	1995-2000	2000-2005	2005-2010	2010-2013
Greece	85.5	89.1	91.4	93.0	94.4	93.1	4.21%	2.58%	1.75%	1.51%	-1.38%
Spain	-	-	-	-	179.2	179.8	-	-	-	-	0.33%
France	86.0	88.4	91.1	95.1	98.2	99.8	2.79%	3.05%	4.39%	3.26%	1.63%
Croatia	-	-	-	56.5	57.3	56.9	-	-	-	1.42%	-0.70%
Italy	-	-	-	-	197.2	199.1	-	-	-	-	0.96%
Cyprus	62.7	70.4	75.0	79.8	90.0	93.5	12.28%	6.53%	6.40%	12.78%	3.89%
Malta	-	-	-	1,279.6	1,311.7	1,339.8	-	-	-	2.51%	2.14%
Slovenia	-	-	57.3	57.7	58.9	59.2	-	-	0.70%	2.08%	0.51%

Eurostat 2016, Own Processing

Table 2: Population Density 1995-2015, NUTS 3

	PD 1995	PD 2000	PD 2005	PD 2010	PD 2015	1995-2015 Change
Achaia	95.2	97.8	97.3	96.6	93.3	-0.01996
Agrigento	156.8	150.9	148.3	148.3	146.2	-0.0676
Aitolokarnania	43.2	42.3	41.4	41.1	38.1	-0.11806
Alicante / Alacant	234.1	247.4	290.1	321.1	320.3	0.368219
Almería	55.7	59.9	70.1	78	79.1	0.420108
Alpes-Maritimes	232.5	237.8	248.5	251.2	252.2	0.084731
Ancona	230.2	233.6	241.4	247.9	243	0.055604
Argolida	28.7	28.5	28.8	28.6	27.7	-0.03484
Arkadia	28.7	28.5	28.8	28.6	27.7	-0.03484
Arta	50.6	50.4	50.1	49.7	46.9	-0.07312
Ascoli Piceno	-	-	-	171.7	171.6	-
Attiki	990.3	1020.4	1041	1050.4	996.9	0.006665
Aude	49.5	51.4	55.2	58.4	59.9	0.210101
Avellino	158.7	156.4	157	156.3	152	-0.04222
Balears, Illes	152.7	165	191.3	217.9	226.8	0.485265
Barcelona	609.9	618.5	670.5	712.4	705.8	0.157239
Bari	-	-	-	325.2	327.5	-
Barletta-Andria-Trani	-	-	-	253.9	255.3	-
Benevento	143.7	141.6	141.3	140.7	135.3	-0.05846
Bouches-du-Rhône	354.9	364.4	379.3	388	397.2	0.119189
Brindisi	224.6	220.3	217.9	218.1	214.8	-0.04363
Cádiz	147.7	149.4	157.1	171.7	171	0.157752
Cagliari	118.5	118.8	119.9	120.9	122.9	0.037131
Caltanissetta	133.1	131.3	129.2	129.8	127.6	-0.04132
Campobasso	82.7	80.9	80.1	79.3	77.3	-0.0653
Carbonia-Iglesias	92.4	89.2	87.8	86.7	85	-0.08009

Caserta	321.5	327.1	335.3	345.3	348.7	0.084603
Castellón /	69.6	72.2	81.5	90	86.6	0.244253
Castelló						
Catania	299.7	300.8	303.3	307.1	312.3	0.042042
Catanzaro	162.3	158.6	155.2	153.8	150.5	-0.0727
Ceuta	3659.3	3737.8	3810.1	4177.4	4456.7	0.217911
Chalkidiki	29	31.4	32.3	33.4	33.9	0.168966
Chania	58.2	60.6	63.1	66	66.8	0.147766
Chieti	150.6	150.4	151.4	152.8	150.7	0.000664
Chios	58.1	58.1	58.5	58.9	58.5	0.006885
Corse-du-Sud	29.8	30.4	33.5	36.1	38.5	0.291946
Cosenza	115.9	113.8	111.5	110.5	106.7	-0.07938
Crotone	105.4	102.8	100.9	100.8	100.5	-0.04649
Cyprus	70.4	75	81.9	90	92	0.306818
Dodekanisos	65.5	70.8	74.3	76.1	76.6	0.169466
Drama	27.6	27.6	28	28.4	28.1	0.018116
Dubrovnik	-	-	66.9	68.9	68.7	-
Enna	73.2	70.8	69.3	68.9	66.2	-0.09563
Evros	34.5	34.2	34.4	34.8	34.8	0.008696
Evrytania	11.1	10.9	11.1	11.4	10.5	-0.05405
Evvoia	50.4	52.1	51.9	52.2	51.3	0.017857
Fermo	-	-	-	203.3	203.9	-
Ferrara	138.6	135.4	136.1	138.7	133.9	-0.03391
Foggia	-	-	-	90.3	90.2	-
Fokida	18.2	18.6	18.9	19.4	19.9	0.093407
Forlì-Cesena	149.4	152.1	158.8	166.2	166.2	0.11245
Frosinone	150.4	150.7	151.6	153.4	152.8	0.015957
Fthiotida	36.7	36.2	36.4	36.6	36.2	-0.01362
Gard	103.7	108.3	115.9	122	127.1	0.225651
Genova	509.4	490.1	482.7	475.3	467.9	-0.08147
Girona	90.1	94.4	111.2	126.2	125.8	0.396226
Goriška	-	-	-	-	51	-
Gorizia	300.9	300.2	306.3	309.9	301	0.000332
Gozo and Comino / Ghawdex u	-	-	450.7	453.8	460.7	-
Kemmuna						
Granada	63.8	64.7	68.3	72.8	72.9	0.142633
Grosseto	48.3	47.8	48.4	49.8	49.8	0.031056
Haute-Corse	29.9	31.1	33.7	35.9	37.4	0.250836
Hérault	140.3	149.9	162.8	172.6	185.2	0.320029
Ibenik	-	-	37.2	37	35	-
Ileia	66.6	64.6	63.1	62.5	60.1	-0.0976
Imathia	82.1	81.8	82.7	84.9	83.2	0.013398
Imperia	184.7	181.1	183	187.7	187	0.012453
Irakleio	104.5	107.9	112.2	116.2	117.6	0.125359
Istria	-	-	72.3	74.1	74	-
Kavala	64.4	65.4	66.6	66.9	64.1	-0.00466
Kefallinia	37.4	40	41.8	43.2	43.1	0.152406
Kerkyra	166.3	166.3	165.9	165.7	162	-0.02586

Kilkis	31.2	31.5	32.4	32.7	31.8	0.019231
Korinthia	60.2	62.5	63.5	64.7	64.8	0.076412
Kyklades	41.1	45.3	47.3	49.3	49	0.192214
La Spezia	259.2	252.6	251	255.2	251.2	-0.03086
Lakonia	38.7	38.8	38	38.3	37.8	-0.02326
Larisa	52.2	53.2	53.6	54.1	52.9	0.01341
Lasithi	39.5	39.8	41.1	41.6	41	0.037975
Latina	220	221.2	228.8	242.8	254.1	0.155
Lecce	292.3	287.3	287.9	290.6	287.7	-0.01574
Lefkada	62.4	65.9	65.6	66.9	67.9	0.088141
Lesvos	48.6	48	48.5	48.7	47	-0.03292
Lika	-	-	10.2	9.6	8.9	-
Livorno	276.4	272.7	274.4	278.9	278.8	0.008683
Lucca	216.4	215.2	218.3	224.1	221.3	0.022643
Macerata	107.5	108.9	112.8	116	115.5	0.074419
Magnisia	75.8	76.4	77.2	78.6	77.7	0.025066
Málaga	166	173.8	196.5	216.8	225.5	0.358434
Malta	1173.4	1208.4	1279.6	1311.7	1369.5	0.167121
Massa-Carrara	176.8	175.5	175.9	177.6	171.9	-0.02771
Matera	62.4	61.4	60.6	60	57.8	-0.07372
Medio Campidano	71.8	70.2	68.9	67.6	65.7	-0.08496
Melilla	4685.8	5022.2	5077.7	5776.1	6513.3	0.390008
Messina	206.5	209	207.2	206	196.9	-0.04649
Messinia	38.7	38.8	38	38.3	37.8	-0.02326
Murcia	97.9	104	117.8	129	129.7	0.324821
Napoli	2628	2638.6	2638.4	2628.9	2642.9	0.00567
Nuoro	42.7	42	41.4	40.8	40.1	-0.06089
Obalno-kraška	-	-	-	-	108.3	-
Ogliastra	32.1	31.6	31.3	31.2	31	-0.03427
Olbia-Tempio	39.6	40.5	41.9	44.3	47	0.186869
Oristano	56.6	55.6	55.2	54.5	53.4	-0.05654
Padova	393.5	401.8	418.9	436.6	437.3	0.111309
Palermo	250.6	250.7	249.4	251.1	254.3	0.014765
Pella	56.2	56.4	57	57.5	55.7	-0.0089
Pesaro e Urbino	-	-	-	141.5	141.1	-
Pescara	242.4	244.9	258.5	268.8	262.1	0.081271
Pieria	76.9	77.8	80.5	84.7	85.9	0.117035
Pisa	159.9	160	163.6	170.6	172.3	0.077548
Pordenone	127.3	130.7	137.5	143.5	137.8	0.082482
Potenza	62.9	61.9	60.9	59.5	56.7	-0.09857
Preveza	50.6	50.4	50.1	49.7	46.9	-0.07312
Primorje	-	-	82.8	82.8	81.3	-
Primorsko-notranjska	-	-	-	-	36.7	-
Pyrénées-Orientales	92.1	97.1	104.2	109.5	114.9	0.247557
Ragusa	182.8	184.1	185.9	190.3	196.8	0.076586
Ravenna	194.1	193.4	201.2	213.3	210.7	0.085523
Reggio di Calabria	185.3	182.8	180	178.1	173.5	-0.06368

Rethymni	48.1	50.8	54.4	57.4	58.4	0.214137
Rimini	-	-	-	370.5	387.7	-
Rodopi	41.5	41.2	43.3	44.8	44	0.060241
Roma	713.2	705.5	716.8	749.7	809.5	0.135025
Rovigo	143.9	142.3	142.5	142.3	132.8	-0.07714
Salerno	222.4	222.4	224	225.6	223.6	0.005396
Samos	54.4	53.3	54.6	55.3	54	-0.00735
Sassari	76.7	75.6	75.9	76.6	78	0.016949
Savona	184.3	180	182.1	185.5	182.2	-0.01139
Serres	47.7	47.2	46.5	46.2	43.4	-0.09015
Siracusa	192.9	190.6	189.4	191.5	190.5	-0.01244
Split	-	-	98.9	100.3	99.9	-
Taranto	243.6	240.3	240.7	242.1	238	-0.02299
Tarragona	90.3	95.2	111.7	128.2	126.5	0.400886
Teramo	147.6	149.4	153.9	159.5	159	0.077236
Thesprotia	27.9	27.9	28.4	29.4	29.7	0.064516
Thessaloniki	286.4	303.4	314.2	320.9	302.4	0.055866
Trapani	175.3	174.5	174.6	175.7	176.5	0.006845
Treviso	314.5	326.3	348.8	362.7	357.4	0.136407
Trieste	1197.7	1155.1	1121.6	1107.5	1105.5	-0.07698
Udine	109.7	109.4	111.5	113.4	109	-0.00638
Valencia / València	199.8	203.7	221.6	239.1	234	0.171171
Var	145.3	153.2	163.9	169.2	175.9	0.210599
Venezia	372.8	372.1	377	388	346.5	-0.07055
Vibo Valentia	157.8	153.1	148.7	145.7	141.4	-0.10393
Viterbo	82.4	83.3	86.1	90.2	88.8	0.07767
Voiotia	41.4	40.7	40.3	41	40.8	-0.01449
Xanthi	55.4	58.5	61.3	63.8	62.6	0.129964
Zadar	-	-	44.5	46.5	46.7	-
Zakynthos	88.9	97.1	99.5	101.1	98.7	0.110236

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Table 3: Degree of urbanization (urban-rural typology 2011) and tourism typology, NUTS 3

Type	Degree of Urbanization
Achaia	Medium Share - Low Growth
Agrigento	Medium Share - Low Growth
Aitolokarnania	Low Share - High Growth
Alicante / Alacant	High Share - High Growth
Almería	Medium Share - Medium Growth
Alpes-Maritimes	High Share - Medium Growth
Ancona	Medium Share - Medium Growth
Argolida	Medium Share - High Growth
Arkadia	Low Share - Low Growth
Arta	Low Share - Low Growth
Ascoli Piceno	Medium Share - High Growth

Attiki	High Share - High Growth	PU
Aude	Medium Share - Low Growth	PR
Avellino	Low Share - Low Growth	IN
Balears, Illes	High Share - High Growth	PR
Barcelona	High Share - High Growth	PU
Bari	Medium Share - Medium Growth	IN
Barletta-Andria-Trani	Low Share - Low Growth	IN
Benevento	Low Share - Low Growth	PR
Bouches-du-Rhône	High Share - High Growth	PU
Brindisi	Medium Share - High Growth	IN
Cadiz	High Share - Medium Growth	IN
Cagliari	High Share - Low Growth	IN
Caltanissetta	Low Share - Medium Growth	IN
Campobasso	Low Share - Low Growth	PR
Carbonia-Iglesias	Low Share - Low Growth	PR
Caserta	Medium Share - Medium Growth	IN
Castellón / Castelló	Medium Share - High Growth	IN
Catania	Medium Share - High Growth	PU
Catanzaro	Medium Share - Low Growth	PR
Ceuta	Low Share - Low Growth	PU
Chalkidiki	High Share - High Growth	PR
Chania	High Share - High Growth	IN
Chieti	Medium Share - Low Growth	PR
Chios	Low Share - Low Growth	PR
Corse-du-Sud	Medium Share - Low Growth	PR
Cosenza	High Share - Low Growth	PR
Crotone	Medium Share - Medium Growth	PR
Cyprus	High Share - Medium Growth	IN
Dodekanisos	High Share - High Growth	PR
Drama	Low Share - Low Growth	PR
Dubrovnik	Medium Share - High Growth	No Data
Enna	Low Share - Low Growth	PR
Evros	Low Share - Low Growth	PR
Evrytania	Low Share - Low Growth	PR
Evvoia	Medium Share - Low Growth	PR
Fermo	Low Share - Low Growth	PR
Ferrara	Low Share - High Growth	PR
Foggia	High Share - Low Growth	PR
Fokida	Low Share - High Growth	PR
Forlì-Cesena	High Share - Low Growth	IN
Frosinone	Medium Share - Low Growth	PR
Fthiotida	Low Share - Low Growth	PR
Gard	Medium Share - Medium Growth	PR
Genova	High Share - Medium Growth	PU
Girona	High Share - High Growth	IN
Goriška	Low Share - High Growth	PR
Gorizia	Medium Share - High Growth	PU
Gozo and Comino	Low Share - High Growth	PU
Granada	High Share - High Growth	IN

Grosseto	Medium Share - Medium Growth	PR
Haute-Corse	Medium Share - Low Growth	PR
Hérault	High Share - Medium Growth	IN
Ileia	Medium Share - High Growth	PR
Imathia	Low Share - Medium Growth	PR
Imperia	High Share - Low Growth	IN
Irakleio	High Share - High Growth	IN
Istria	High Share - High Growth	No Data
Kavala	Medium Share - High Growth	PR
Kefallinia	Medium Share - High Growth	PR
Kerkyra	High Share - High Growth	PR
Kilkis	Low Share - High Growth	PR
Korinthia	Medium Share - Low Growth	PR
Kyklades	High Share - High Growth	PR
La Spezia	Medium Share - High Growth	PU
Lakonia	Low Share - Medium Growth	PR
Larisa	Low Share - Low Growth	PR
Lasithi	High Share - High Growth	PR
Latina	Medium Share - Low Growth	IN
Lecce	High Share - Medium Growth	IN
Lefkada	Low Share - Medium Growth	PR
Lesvos	Low Share - High Growth	PR
Lika	Low Share - High Growth	No Data
Livorno	High Share - Medium Growth	IN
Lucca	High Share - Low Growth	PU
Macerata	Low Share - Medium Growth	PR
Magnisia	Medium Share - Low Growth	IN
Málaga	High Share - High Growth	PU
Malta	Low Share - High Growth	PU
Massa-Carrara	Medium Share - High Growth	IN
Matera	Low Share - Low Growth	PR
Medio Campidano	Low Share - High Growth	PR
Melilla	High Share - Medium Growth	PU
Messina	Low Share - High Growth	IN
Messinia	Medium Share - High Growth	PR
Murcia	High Share - High Growth	IN
Napoli	High Share - High Growth	PU
Nuoro	Medium Share - High Growth	PR
Obalno-kraška	Medium Share - Medium Growth	IN
Ogliastra	Low Share - High Growth	PR
Olbia-Tempio	High Share - High Growth	PR
Oristano	Low Share - High Growth	PR
Padova	High Share - High Growth	IN
Palermo	High Share - Medium Growth	PU
Pella	Low Share - Low Growth	PR
Pesaro e Urbino	Medium Share - Medium Growth	PR
Pescara	Medium Share - Low Growth	
Pieria	Medium Share - High Growth	PR
Pisa	Medium Share - Medium Growth	IN

Pordenone	Low Share - Low Growth	IN
Potenza	Low Share - High Growth	PR
Preveza	Low Share - Low Growth	PR
Primorje	Medium Share - High Growth	No Data
Primorsko-notranjska	Low Share - High Growth	No Data
Pyrénées-Orientales	Medium Share - Low Growth	IN
Ragusa	Medium Share - High Growth	IN
Ravenna	High Share - Low Growth	IN
Reggio di Calabria	Low Share - High Growth	IN
Rethymni	High Share - High Growth	PR
Rimini	High Share - Low Growth	PU
Rodopi	Low Share - High Growth	PR
Roma	High Share - Low Growth	PU
Rovigo	Low Share - High Growth	PR
Salerno	High Share - Low Growth	IN
Samos	Medium Share - High Growth	PR
Sassari	Medium Share - High Growth	PR
Savona	High Share - Low Growth	IN
Serres	Low Share - Low Growth	PR
Sibenik	Low Share - High Growth	No Data
Siracusa	Medium Share - High Growth	IN
Split	Medium Share - High Growth	No Data
Taranto	Medium Share - Low Growth	IN
Tarragona	High Share - High Growth	IN
Teramo	High Share - Low Growth	PR
Thesprotia	Low Share - Medium Growth	PR
Thessaloniki	High Share - High Growth	PU
Trapani	Medium Share - Medium Growth	IN
Treviso	Medium Share - High Growth	IN
Trieste	Medium Share - High Growth	PU
Udine	High Share - Medium Growth	PR
Valencia / València	High Share - High Growth	PU
Var	High Share - Medium Growth	IN
Venezia	High Share - High Growth	IN
Vibo Valentia	Medium Share - Medium Growth	PR
Viterbo	Low Share - Low Growth	PR
Voiotia	Low Share - Low Growth	PR
Xanthi	Low Share - Medium Growth	PR
Zadar	Low Share - High Growth	No Data
Zakynthos	High Share - High Growth	PR

Eurostat 2011, Own Processing

Table 4: Coastal regulation in Mediterranean countries

	Specific Legislation related to coastal zone	Framework Law	Definition of littoral zone/ Construction Limits set by law
Algeria	Yes	Yes, 2002	Littoral zone is from 800 m to 25 km. Also defines littoral plain of 3 km. No construction within 100-300 m.
Bosnia-Herzegovina	No		No limits set by law. Construction limits defined by regulation plans
Croatia	Yes, 2004 Regulation (2008, part of Physical Planning Law)		Marine property is a 6-metre strip. Regulation of 2004 defines coastal zone of 1.000 m. No construction within 70 m. (housing) and 100 m. (tourism) in urban areas and 100 m. in other areas.
Egypt	Yes		Very general littoral zone (up to 30 km.). No building normally within 200 m. Building within 200 m. requires an EIA.
France	Yes	Yes, 1986	Littoral zone is defined by coastal municipalities. No building within 100 m.
Israel	Yes		Varies from 1-2 km. No building allowed within 100 m.
Italy	Yes		Varies according to ecological region. No building within 300 m. Some regional variations (e.g. Sardinia).
Malta	No		Littoral zone is 250 m. No construction within zone of variable depth.
Morocco		Draft Law	No construction within 100 m. besides for activities that require the nearness of the sea.
Spain	Yes	Yes 1988	Land bound limit is 500 m. Construction allowed within 100-200 m. is restricted but not banned.
Tunisia	Yes		Limits vary from site to site. No construction is permitted within 100 m. Within settlements construction is permitted within 25 m.
Turkey	Yes	No	Landward limit is 100 m and is uniform along the whole coast. Construction prohibited within 50 m. but exceptions are made.

PAP/RAC from Markandya et al., 2007 (Retrieved from UNEP/MAP, 2009)

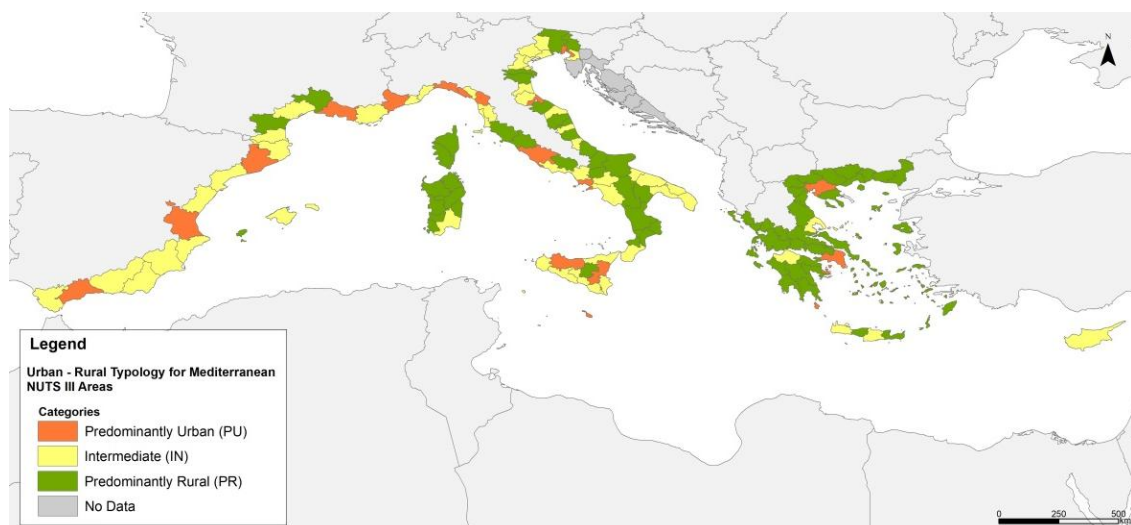


Figure 1: Degree of urbanization (urban-rural typology 2011), Mediterranean NUTS III
Eurostat 2011, Own Processing