

Conflict/Synergy among different uses on land and at sea and land-sea interaction in Blue Growth

- Mediterranean Scale -



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OVERVIEW

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Abstract

This work consists in determining the type of relationship (conflict or synergy) that exists between tourism on one side and agriculture, aquaculture and industry on the other.

In this work, two analytical approaches were used: a statistical one with RSTUDIO and a spatial analysis one with QGIS.

Coastal/maritime tourism development in the Mediterranean region is being influenced by industrial development, which poses a significant challenge due to the vulnerability of the tourism sector. However, it is important to note that aquaculture presents an opportunity for synergy with the development of coastal tourism.

I. Introduction

Today, the economic activity generated by tourism is one of the most important industries in the world. It derives its importance from its participation in the world GDP, the jobs it creates and that it represents an important source of foreign currency for the host countries or destinations. (Montargot et Ouchen., 2018)

Indeed, in 2019 the total number of tourists all over the world reached 1.4 billion tourists with an increase of 4% compared to the year of 2018 and in turn, the total revenue reached 1700 billion in the balance of payments with a 5% increase compared to 2018 (Organisation Mondiale du Tourisme UNWTO, 2019)

The Mediterranean area is one of the busiest tourist destinations with 300 million tourists, which represents 30% of international arrivals worldwide (TourMag., 2017), thanks to its strategic position and its climate, which represents a factor essential and a main determinant in the choice of destination for international tourists (Dwyer and Kim., 2003).

In addition, in 2015 the tourist activity generated 11.3% of total jobs and contributed 11.5% of the total GDP of the Mediterranean region (WTTC., 2015).

Like any industry, and over time, with all the benefits it brings, tourism has impacts on various levels (economy, environment, human health) and influenced by factors and variables that can boost development or cause an inhibitory action on its growth.

These factors can be natural (climatic factors, geography and topography of destinations) or unnatural such as anthropogenic factors generated by human activities (pollution, exploitation of nearby surfaces in industry or agriculture, political stability and level of crime) (Satta., 2004).

On the Mediterranean coast, the authorities and those responsible for the development of the tourism sector are faced with a complex issue, characterized by the contradiction of the development of economic activities represented by aquaculture, agriculture and industrial activities as well as the areas entrusted to these activities and the development of the tourist industry in the region which represents an asset for the economy of the Mediterranean countries.

This work, which is part of the **Co-Evolve4BG** project, aims to study the type of relationship that exists between these variables and the development of coastal tourism in the Mediterranean.



II.

Data analysis

II. Data analysis

The Co-Evolve4BG project team has succeeded in developing a database that summarizes 3 levels of study in the 5 member countries of the project.

Indeed, we will approach the analysis of the data already required at the NUTS/ GOUVERNORATE level, at the department/region level and at the global country level.

The analysis of these data will be carried out by means of software “Rstudio” and a cartographic analysis via the software “Qgis” to validate the results resulting from the statistical analysis

II.1. Port and airport dynamics

The database summarizes the evolution of four (4) study variables for the 10-year period (2009-2019). These variables are respectively: “area allocated to tourism”, “area allocated to aquaculture” “area dedicated to agriculture” and “area dedicated to industry”.

In terms of gain of dedicated areas for the tourism industry in the 5 countries concerned by the study, we note that Tunisia is first place with a gain of 162.11% in 10 years (they went from 2142.41 ha in 2009 to 5615.41ha in 2019) followed by Lebanon (31.98%) and Spain in last place (4.51%).

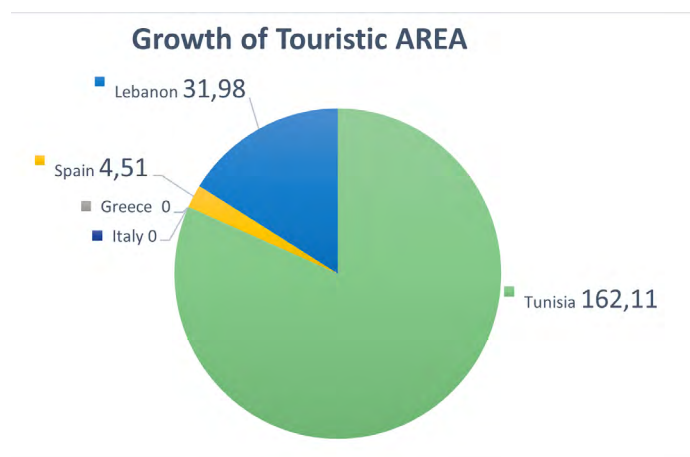


Figure 1. Growth of touristic area (by country)

The map below (Figure 2) shows the distribution of the spatial growth of tourism by each country.

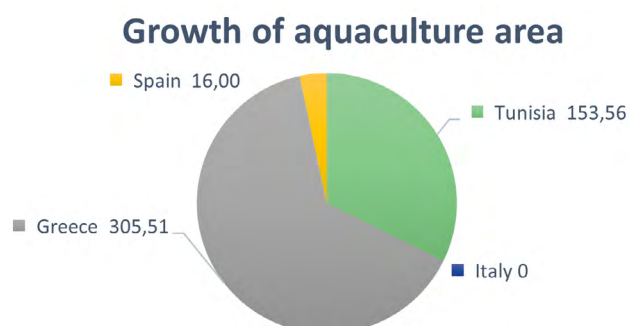


Figure 2. Spatial distribution of growth touristic areas

II.2. Evolution of Aquaculture areas

According to the database generated by the field team of the Co-evolve4BG project, and over a period of 10 years (2009-2019), each country of the 5 included in the project has experienced a gain in area dedicated to aquaculture (data not available for Italy and Lebanon).

Indeed, for Tunisia, these areas were 984.7ha in 2009 and they became 2496.8ha in 2019 with a gain of 153.56%. While for Greece, they went from 1615.58ha in 2009 to 6551.39ha in 2019, an increase of 305.51%.



In Spain, the areas dedicated to aquaculture have not increased too much during this period: they have increased from 3444.79ha in 2009 to 3996.05ha in 2019 (a gain of 16%).

Figure 3. Growth of aquaculture areas by country

The map below shows the distribution of growth (shrinkage) rates of areas dedicated to aquaculture by country.

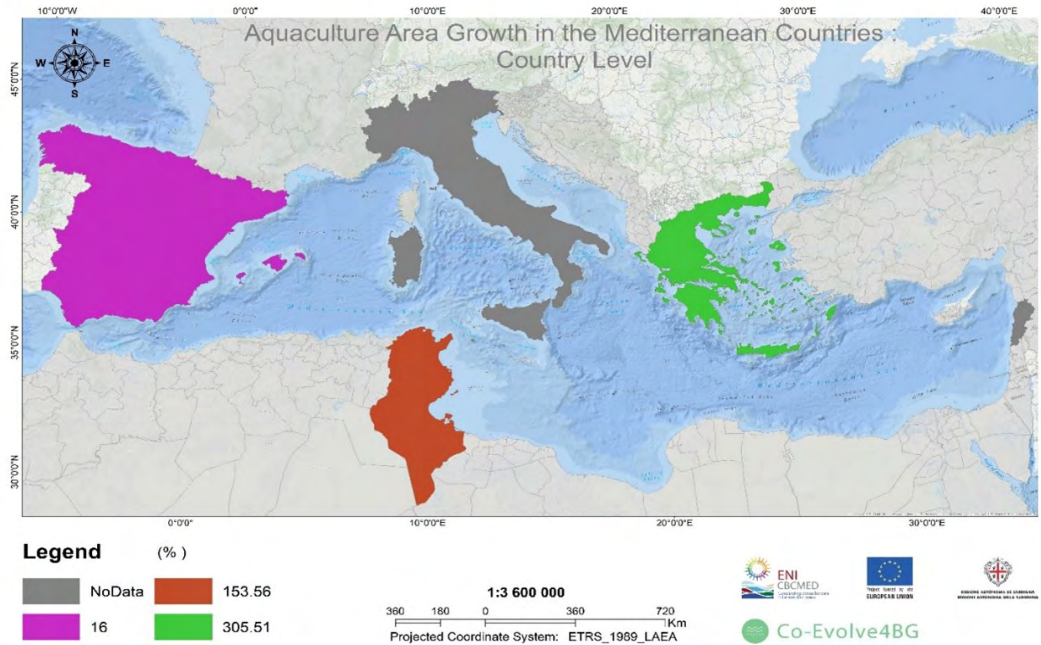
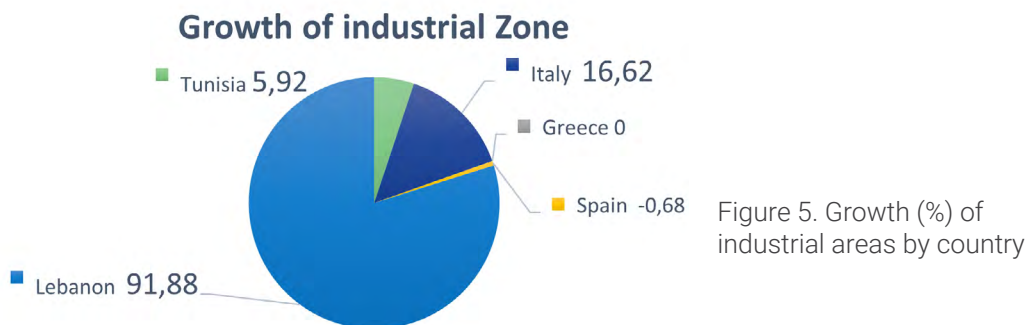


Figure 4. Aquaculture area growth in the Mediterranean countries

II.3. Evolution of Industry areas

Regarding the areas dedicated to industrial activities on the coast in the countries involved in the project, it is clear that Lebanon is on top of the list of countries with a rate of gain of these areas that goes up to 91% between 2009 and 2019 followed by Italy with 16.62% gain and Tunisia with 5.92%. While Spain is the only country that has suffered a regression of areas dedicated to these activities (-0.68%).



The map below (Figure 6) shows the distribution of growth (shrinkage) rates of areas dedicated to industry by country.



Figure 6. The distribution of growth (shrinkage) rates of areas dedicated to industry by country.

II.4. Evolution of Agricultural areas

Still at the country level, agriculture is one of the parameters to be studied in this study to know if its development can have a relation on the development of coastal tourism in the Mediterranean and more precisely in the 5 countries included in our project.

Indeed, during 10 years and over the period from 2009 to 2019, we notice that Lebanon has lost the most areas that were devoted to agriculture compared to the other 4 countries with a loss rate of -19.82% (18069 ha in 2009 compared to 14488 ha in 2019).

In second place, we find Greece that lost 5.86% of areas dedicated to agriculture for the same period followed by Italy (-1.65%).

On the other hand, Spain and Tunisia have devoted more land for agriculture during this period successively with 2.07% (+93 645ha) and 0.76% (+30050ha).

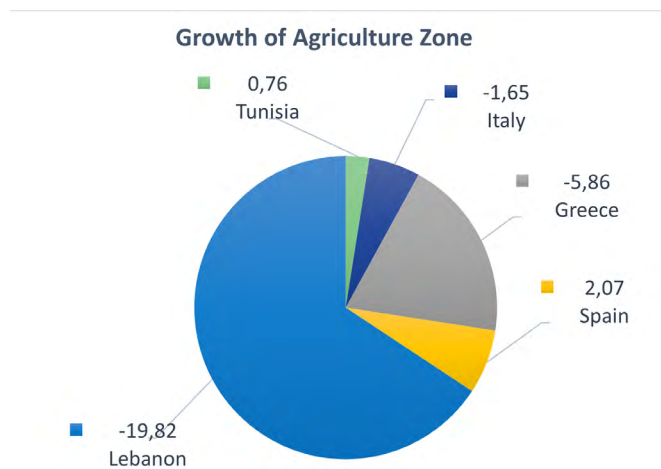


Figure 7. Evolution of agricultural areas (%) by country (2009 to 2019)

The map below shows the distribution of growth (shrinkage) rates of areas dedicated to agriculture by country.

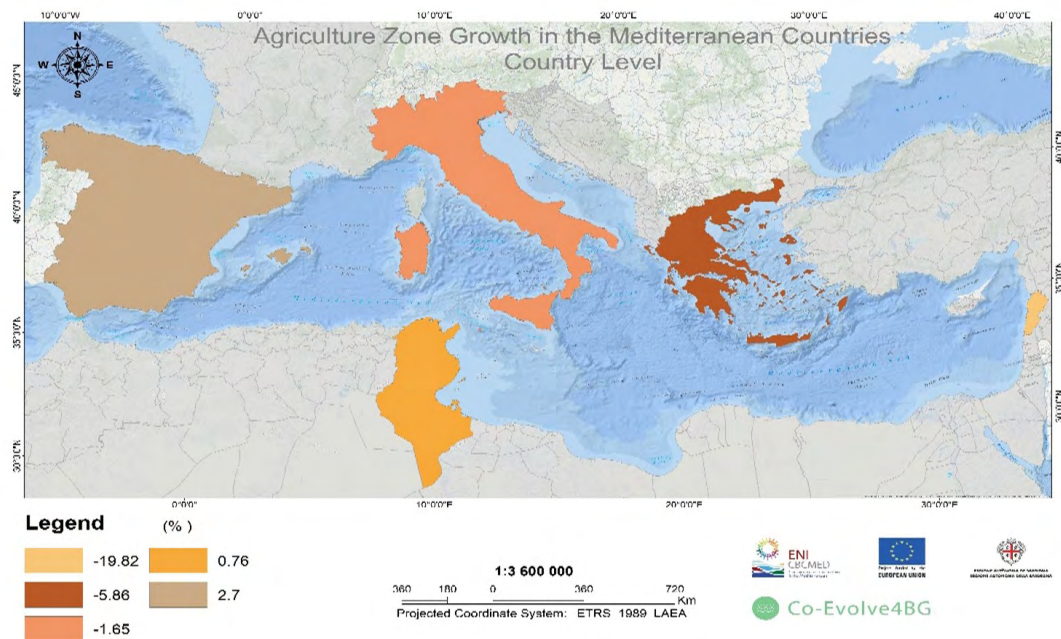


Figure 8. Spatial distribution of agricultural areas growth (%)

III.

Cartographic Analysis

III. Cartographic Analysis

III.1. Tourism and Aquaculture

Aquaculture has the most influence on tourism. Indeed, this influence is strongly observed in Tunisia as an average synergy in the majority of governorates (absence of data for the governorate of Sfax) given the nature of the country's economy that is based on agriculture largely followed by tourism. It is obvious, therefore, to find a positive interference between the two sectors.

In Italy, aquaculture is in conflict with tourism in all NUTS according to the results already found in the previous step. However, this conflict is characterized by its low level.

On the other hand, Spain is a heterogeneous country where half of the coastal NUTS3 are characterized by the presence of a conflict between aquaculture and tourism and the rest do not.

As far as Greece is concerned, the majority of NUTS3 are characterized by the presence of a conflict between tourism and aquaculture (Figure 9).

While a minority is marked by the absence of this conflict such as NUTS3: Atica, Crete, Ionian Islands etc... Where there is a synergy between the two sectors.

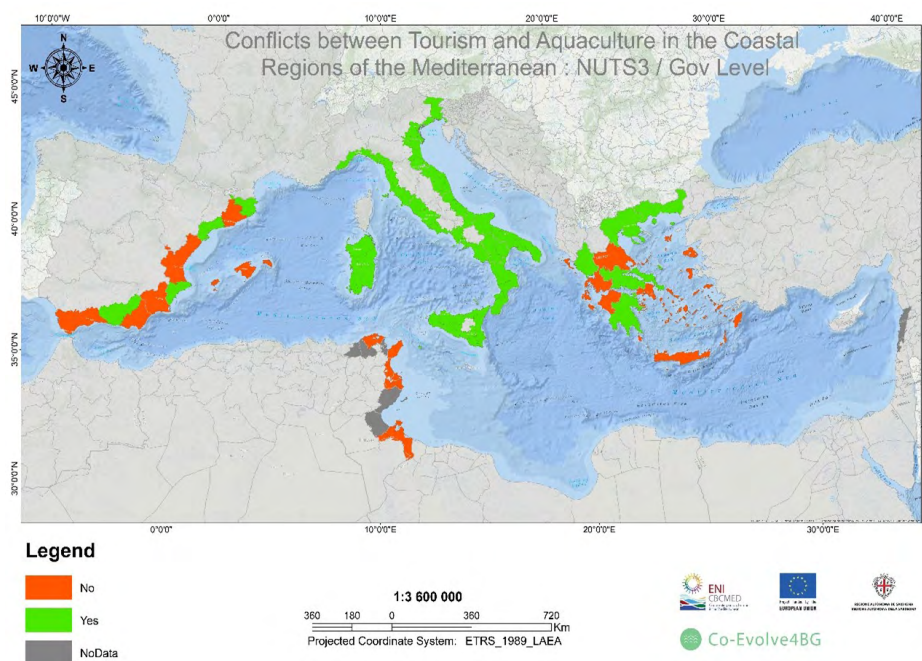


Figure 9. Conflicts between Tourism and Aquaculture in the Coastal Regions of the Mediterranean : NUTS3 / Gov Level

From Figure 10, the conflict between aquaculture and tourism is largely at the medium level.

In Lebanon, there is no conflict between aquaculture and tourism, on the contrary, there is cooperation and synergy between the 2 sectors.

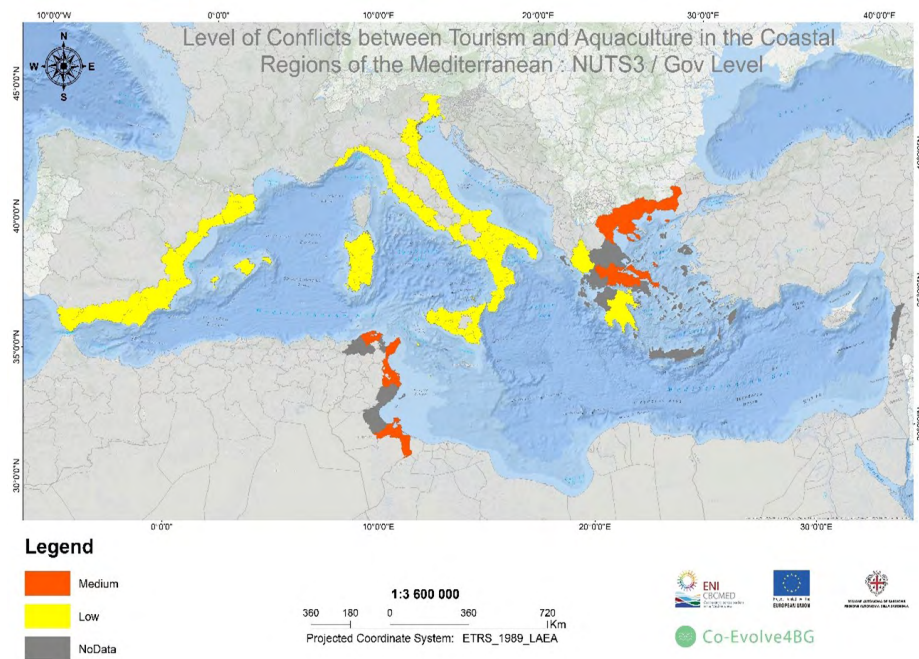


Figure 10. Level of conflicts between Tourism and Aquaculture in the Coastal Regions of the Mediterranean : NUTS3 / Gov Level

III.2. Tourism and Agriculture

Agriculture has a conflict effect with tourism in Tunisia, Italy and Lebanon given the nature of the economies of the 3 countries with a low level except in some NUTS3 of Lebanon namely Bierut which is characterized by a high conflict level between the sectors (Figure 12).

In Spain, and according to the results of the principal component analysis, agriculture is in conflict with tourism in some NUTS 3 such as Tarragona and Alicante while for the rest of the coastal NUTS it is in synergy with tourism.

In Greece, agriculture has no effect on tourism development except for NUTS3: Crete, Ionian Islands and North Aegean, which are characterized by a high conflict level.

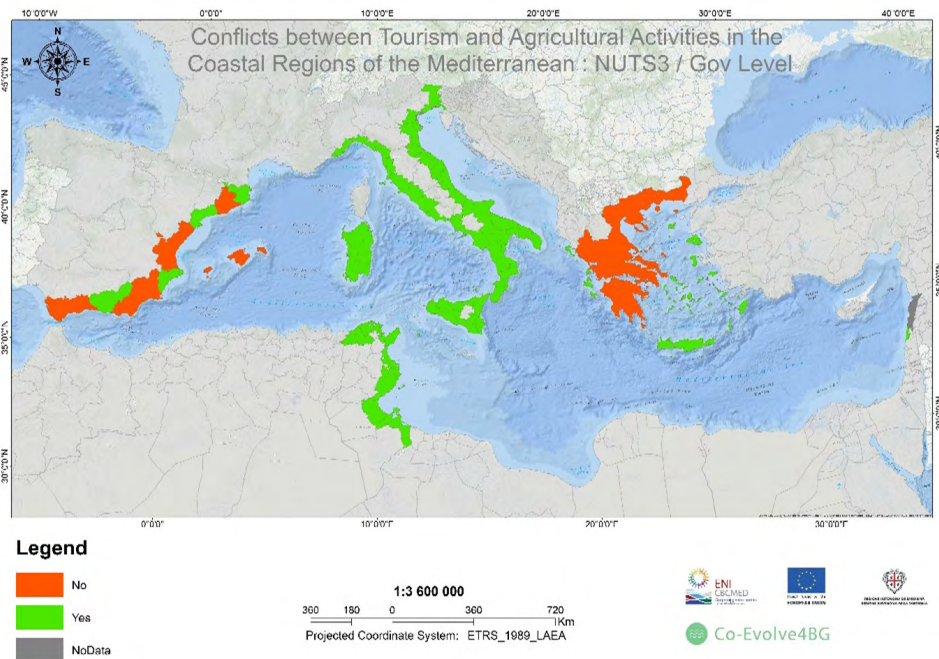


Figure 11. Conflicts between Tourism and Agricultural Activities

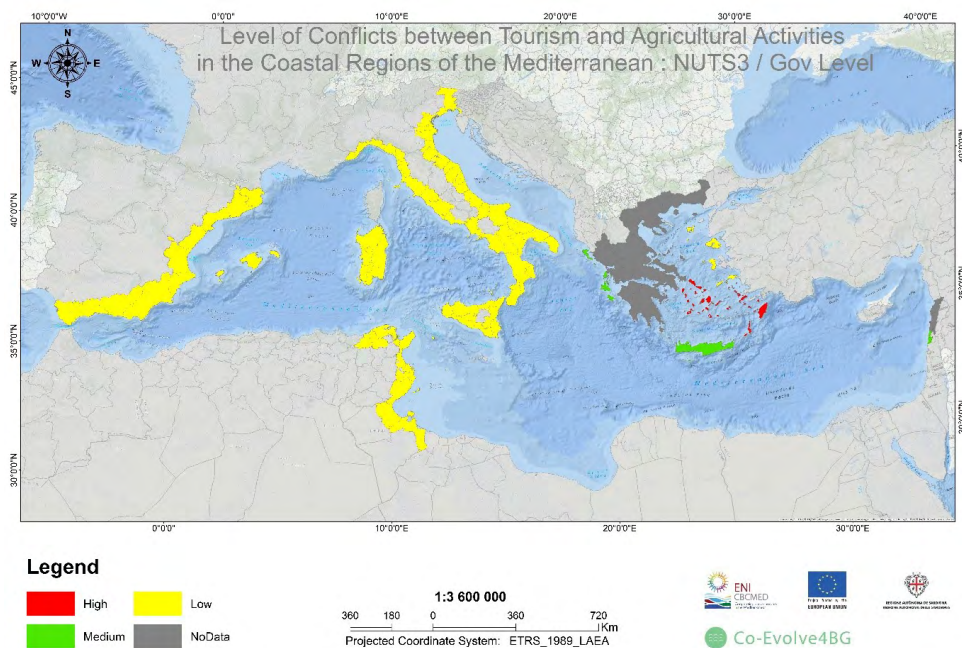


Figure 12. Level of conflict between tourism and agriculture

III.3. Tourism and Industry

Industry is one of the sectors that have the most conflict with the development of tourism in Italy (Figure 13) with a high level in all NUTS3 of the country (Figure 14). In fact, the development of this sector necessarily causes the decline and fall of the other and vice versa.

In Tunisia, the industry is in conflict with tourism in the majority of governorates, with a strong level essentially in the governorate of Gabes while it is average or even absent for the others thanks to the nature of the country's economy which is based on light industries and agriculture favored by the extension of plains and flat lands suitable for agriculture.

On the other hand, according to Figure 14, there is no conflict (undisplaceable effect) of the industry on tourism in Spain, Lebanon and Greece.

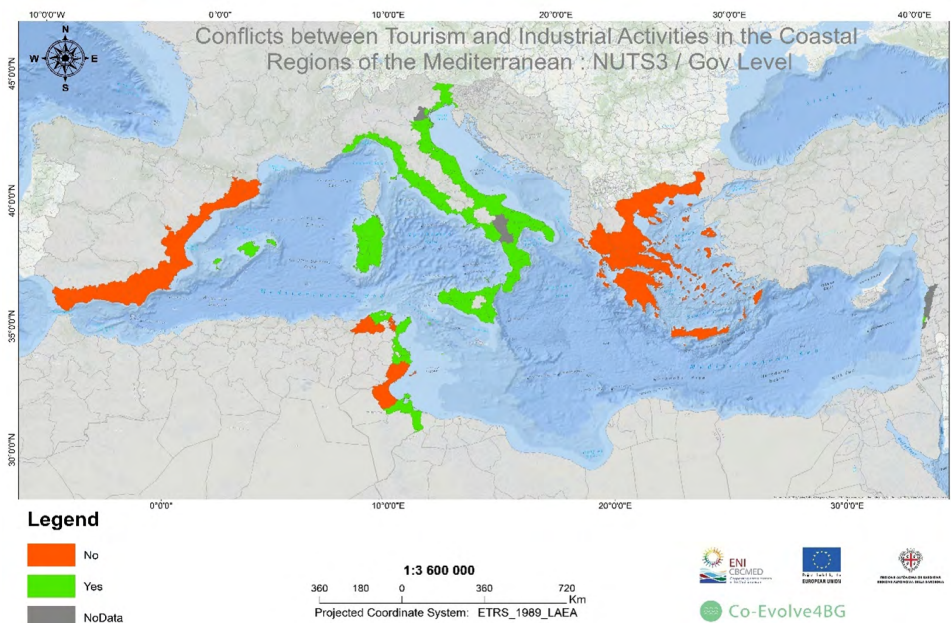


Figure 13. Conflicts between Tourism & industry- NUTS3 level

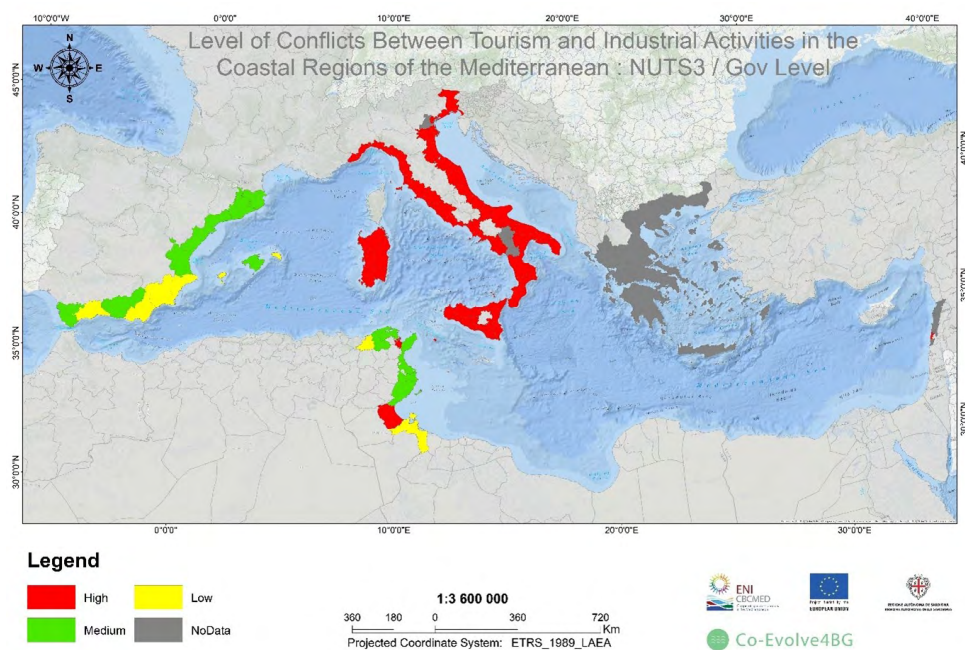


Figure 14. Level of conflicts between Tourism & industry- NUTS3 level

IV.

Conclusions

IV. Conclusions

Tourism is a vital sector and industry for all countries in the world and especially for the Mediterranean countries thanks to its important contribution in the economy, in GDP and in job creation, must be more and more organized especially in southern Mediterranean countries.

The nature of each country's economy has a direct and major effect on the relationship and level of conflict between tourism and the factor under study.

Industry is the most harmful sector for the development of tourism. This has been highlighted by this study. This is especially true in Italy in the whole country and in Tunisia in the NUTS3 of Gabes and Tunisia.

Indeed, the development of this sector necessarily causes the decline of coastal tourism in the five member countries of our project.

Apart from its indisputable effects on the environment (biocenosis), human health, the industry is noted for its inhibiting effect on tourism development in the Mediterranean and on the different scales (country, region and NUTS3). This is evidenced by the effects noticed, for example, at the NUTS3 level of Gabes in Tunisia.

In return, tourism also has its own effects on other factors. Despite its positive impact on economic growth, tourism activity generates negative effects on the environment and thus compromises the future of economic development.

The excessive concentration of tourist investments in coastal regions has generated an occupation of vast areas of the coastline in often-vulnerable sites and a degradation of the urban and natural environment.

This is why the authorities have chosen to adopt the model of sustainable tourism such as that applied to the Gouvernorate of Medenine (the coasts of the island of Djerba) to ensure a parallel development of all activities taking into account the preservation of the environment.

Unlike industry, the level of conflict between agriculture and tourism is globally low (except in some NUTS3 in Lebanon).

It can go up to a synergy between the factors (in Greece and in some NUTS 3 in Spain such as Barcelona, Girona, and Alicante).

On the other hand, in Lebanon, agriculture is in strong conflict with tourism. In Beirut, tourism and the areas dedicated to this activity have dominated over those dedicated to agriculture, especially on the coast.

On the contrary, the lack of data for some areas (some NUTS3) or countries could not give us reliable results or it prevented us to apply a Principal Component Analysis. That is why the interpretations and conclusions of these areas were made only depending on the cartography made with Qgis software.

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