OTREMED

TOOL FOR COMPETITIVENESS STRATEGY IN THE EUROPEAN MEDITERRANEAN

otremed

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L'Europe en Méditerranée
Europe in the Mediterranean

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OTREMED
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Introduction

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OTREMED, territorial observatory of the mediterranean regions

The Mediterranean regions share a reality and some particular characteristics that have made the Mediterranean a territory with its own identity and an important territorial heritage. This uniqueness is reflected in its territorial structure which, above all, is that of a dynamic space, characterised by considerable natural and cultural wealth, and a strong attraction for population settlement and economic activity.

However, its territorial reality continues to be that of a fragmented and unbalanced space, where urban pressure, the deficiency of transport and communication networks, as well as the concentration of the population along the coast and the pressure of immigration, continue to be problems throughout the Mediterranean area.

In Europe as a whole, the peripheral position of the Mediterranean space, far from the dynamic centre of development and decision making, also bears a considerable influence on the difficulty in achieving adequate competitiveness.

Therefore, the public powers should be in a position to take decisions that make the most of the possibilities and potential offered by the Mediterranean territory, within the objectives originating in European Territorial Strategy: economic and social cohesion, the conservation of natural resources and cultural heritage and a more balanced competitiveness of the European territory.

Within a global vision of sustainability and respect for the environment, the driving force behind this development should be provided by certain aspects emphasised in the Lisbon Strategy: To face the technological challenge to boost activities in the most advanced sectors, to develop the knowledge society and to improve territorial competitiveness.

But the increasingly complex territorial reality makes it difficult to reach decisions without the availability of precise information that interrelates the different factors and which, moreover, is global, within the spheres of its territorial influence. Decisions that involve strategies for developing the challenges of competitiveness will require information compared with other Mediterranean regions, territorial globality and the conditioning factors related with territorial cohesion, making it necessary to develop lines of study based on the experience of other regions.

This information, currently dispersed and not very coherent, requires an instrument that is able to bring together data from different regions that can be standardised.

OBJECTIVES

To achieve this, the European OTREMED project proposes the development of an instrument for territorial planning aimed at improving the competitiveness of the MED, touching on aspects such as the coordination of land uses in the border territories between regions, the correction of the concentration of the population on the coast, the enhancement of the landscape, adaptation to the effects of climate change or migratory flows from the southern shore of the Mediterranean, and the development and organisation of tourism, among other aspects.

Part of the need to provide public administrations with competence in territorial planning with an instrument to facilitate management and decision making for territorial governance, is in accordance with the structure and dynamics inherent to the uniqueness and quality of the Mediterranean space. This instrument consists of the creation of an Observatory Network that involves all the regions of the European Mediterranean space. The idea is to share territorial information via nodes that are able to generate information at the same time as using the information generated by others. The compared information, thus obtained, allows better overall knowledge of the use of the Mediterranean territory, making it possible to learn via the experience of other regions.

This facet of interacting in a network, generating and exchanging information, is the basis for the originality offered by the OTREMED project, the basic principle being that everyone is responsible for the information they generate and everybody can use this information without any restrictions.

The first OTREMED objective is the creation of instruments that allow the factors of territorial competitiveness to be identified and reinforced, especially via the strengthening of economic and social cohesion, set out in the Lisbon Agenda (2000) and the Gothenburg Agenda (2001), and more recently the concept of territorial cohesion resulting from the Lisbon Treaty (2009), as well as the challenges of competitiveness of the Europe 2020 strategy.

OTREMED is fully incorporated within the fundamental principles of territorial planning which, as we are aware, play the passive role of distributing uses or assigning intensities of use in the territory and another more proactive role of detecting the challenges of territorial opportunity that allow greater integration in development, in accordance with the principles of sustainability, related with greater rationality in land use.

RESULTS

To attain these objectives, OTREMED is developing, in coherence with Directive 2007/72/EC, the INSPIRE Directive, the implementation of a Geoportal

to host the Spatial Data Infrastructure of the Mediterranean Regions (SDIMED: spatial data infrastructure European Mediterranean) as the appropriate solution to share, manage and standardise the geographic information with territorial relevance available in the Mediterranean space, originating in other national or regional SDIs. From the Geoportal it will be possible to view all this information via any of the browsers available on the market (Internet Explorer, Mozilla Firefox, etc.).

SDIMED constitutes the necessary technical foundation for the establishment of an Observatory Network for the Mediterranean Regions. This instrument will make it possible to study the evolution of the different territorial variables of relevance for decision making, modelling the different scenarios that should be taken into consideration.

BASIC DATA OF THE EUROPEAN OTREMED PROJECT.

The European OTREMED project, Instrument for the Territorial Strategy of the MED space, was co-funded by the ERDF within the MED 2007-2013 Territorial Cooperation Programme. Its execution period is 36 months, from September 2010 until August 2013.

It is managed and coordinated by the Region of Murcia, and it brings together 12 partners of the Mediterranean space that represent 6 countries (Regions of Abruzzo, Sardinia, Emilia-Romagna, Lazio, Piamonte, Sicily, The Algarve, Valencia and Murcia, as well as the Anton Melik Geographic Institute of Slovenia, the University of Patras (Greece) and the Mediterranean Institute).

OTREMED responds to three general objectives:

1. The creation of a common and transferable methodology, that provides patterns to assess territorial planning and guide decision making, according to a joint territorial strategy of the MED territory.
2. To improve the competitiveness of the MED space, guaranteeing its economic growth, the creation of employment, and social and territorial cohesion.
3. To achieve a positive impact in the public policies involved in sustainable and balanced development of the territory.

OTREMED is structured according to the following thirteen basic actions:

1. CAPITALISATION OF PREVIOUS WORK, to compile, analyse and develop existing studies on the territorial model of the Mediterranean and MED mapping. It will seek complementarity and synergy with other projects of different European programmes.
2. TERRITORIAL CHARACTERISATION OF THE MED SPACE, to identify the current territorial model of the MED, as well as perceptions and trends.
3. A MAPPING HOMOGENISATION PROTOCOL to facilitate the transfer of mapping data in the MED space.
4. A METHODOLOGY FOR THE DESIGN OF A TERRITORIAL STRATEGY, that identifies territorial factors and indicators, to evaluate the coherence between the land use and territorial structure of the MED.
5. A BOARD OF EXPERTS, who will rigorously and independently guide and assess the scientific-technical quality of results of the project.
6. ROUND TABLES, to allow participation by relevant social agents in the prioritisation of territorial factors and indicators.
7. PILOT ACTIONS, which will test its applicability in the partners' territories, at provincial (NUTS 3) and municipal (LAU 2) scale
8. TECHNICAL WORKSHOPS, for transfer and application of the results in the partners' territories.
9. COMMUNICATION AND CAPITALISATION STRATEGY, which will be implemented throughout the project.
10. WEB PAGE (www.otremed.com), to achieve dissemination of the development of the project.
11. OTREMED DESIGN AND TESTING GUIDE, which will include the main results of the project and will contain a manual for the implementation of SDIMED in different territorial nodes.
12. INTERREGIONAL FORUM, to make the results of OTREMED known to other "Key players" of territorial governance.
13. LETTER OF INTENT, that seeks the greatest consensus in the application and continuity of OTREMED.

Methodology developed

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The OTREMED methodology

To obtain the corresponding objectives, the OTREMED project is structured into 5 parts:

PART 1. COMMUNICATION AND PARTICIPATION

STAGE 1.1. MULTILINGUAL WEBSITE: www.otremed.com

This is divided into the two following areas:

- Private access, so that all the documentation produced by the members in the different stages of the project can be passed on and exchanged. Insofar as possible, the presentation of the work has been standardized. There are a lot of diagrams, graphs and scale maps in particular.
- Public access, so that the results of the different activities and stages can be presented and a public participation process can be developed in the regions where the pilot tests have been carried out.

STAGE 1 .2. ROUNDTABLE DISCUSSIONS

During the initial stage of the pilot tests (part 4), regional or local roundtable meetings have been held which the public and private agents that are involved in the spatial planning have taken part in.
A working paper that contains the conclusions made about the different stages involved in building the tool has been used as the basis to select and give priority to certain territorial factors and indicators determined whilst the tool was being built (part 3). The 11 challenges or territorial subject matters have been included.

STAGE 1.3. REGIONAL AND LOCAL SEMINARS

Three local seminars have been organised at the head offices of the members from the region of Emilia-Romagna (Italy), the University of Patras (Greece) and the region of Murcia (Spain) to publicise and disseminate the results of the project. The matters discussed in each of these seminars are related to the actual stage of the project in progress at the time of the meeting in question.

- 1st Seminar: "Mediterranean Space and European Strategy 2020."
- 2nd Seminar: "Land use: Concentration, dispersion and fragmentation."
- 3rd Seminar: "SDIMED, GeoNetwork opensource for a Competitive Territorial Strategy of the European Mediterranean."

STAGE 1.4. METHODOLOGICAL GUIDELINES AND EXPERIMENTAL HARMONIZATION

In paper and digital format that includes:

- Methodological Guidelines:
  a) Territorial challenges
  b) Harmonizing cartographic databases
  c) Territorial factors and indicators.
- Data on the pilot tests, that will include:
  a) Presenting the scope of the project
  b) Choosing the indicators determined during the roundtable discussions
  c) Using the new tool
- Conclusions.
  This publication will be presented to the European spatial planning networks.

PART 2. STEERING COMMITTEE

The Steering Committee is in charge of running the project, it is made up of all the members and it is chaired by the Lead Partner. Fundamental decisions are made during the committee meetings so that the project is carried out properly; alternative options are considered, certain lines of work are approved, questions are answered, reports provided by the experts are discussed, the account statements are approved and budgetary decisions are made. In short, it is the governing body of the project.
Six Steering Committee meetings have been held during the project, in the following cities, where the different members of the project are located:

- Ljubljana (Slovenia), the 18th of October, 2010.
- Faro (Algarve, Portugal), the 21st and the 22nd of June, 2011.
- Bologna (Emilia-Romagna, Italy), the 26th of October, 2011.
- Palermo (Sicily, Italy), the 22nd and the 23rd of March, 2012.
- Patras (Greece), the 22nd of November, 2012.
- Murcia (Spain), the 28th and the 29th of May, 2013.

PART 3. BUILDING THE TOOL

STAGE 3.1. SETTING UP THE BOARD OF EXPERTS

The Board of Experts is made up of five experts on spatial planning, (four of them are from the countries involved in the project and the fifth represents non-participating regions of the CRPM).
Its role has been to give advice and evaluate the planning and the guidelines established during the technical stages of the project. To this end, the corresponding work has been sent to the members to be studied. At each of the meetings held, one of the members of the Board of Experts is designated as the speaker and the writer of the definitive report on such. Four meetings

have been organised: one for each of the stages 3.2; 3.3; 3.4 and another while part 4 was being tested. The development and the results of the Board of Experts are covered in detail in section 2.6.

STAGE 3.2. TERRITORIAL DEFINITION OF MED SPACE

This study has been carried out according to the following requirements:

- a) It is based on a document that contains summaries of previous studies and projects.
- b) It is structured according to the 11 competitiveness challenges for the MED space established in the PIC.RM project, which are:
  1. Reviving the urban system
  2. Urban-rural relations
  3. Governance, social participation and quality of life
  4. Research, development and innovation
  5. Access to transport
  6. Access to information technology
  7. Natural Disaster Prevention
  8. Sustainable energy
  9. Use and sustainable management of natural resources
  10. Use and sustainable management of cultural resources
  11. Sustainable Regional Economic Development.
- c) The specific analysis has been defined for each subject matter and this includes comparing the different geographic locations, a diagnosis and making a few conclusions that are focused on the following stage. This is covered in detail in section 2.3.

STAGE 3.3. IDENTIFYING TERRITORIAL FACTORS

For each of the competitiveness challenges, territorial factors that are related to the scales defined in the project, namely the NUTS 3 and LAU 2 units of analysis, have been proposed in accordance with the Geocode Standard Nomenclature of Units for Territorial Statistics, defined by Eurostat. This is covered in detail in section 2.4

STAGE 3.4. ESTABLISHING TERRITORIAL INDICATORS

For every territorial factor, one or various indicators have been established as an ideal way to gauge these factors.

The indicators are based on cartographical elements (point, line, area) and they have been defined in line with the working scale or scales in which they are used. This is covered in detail in section 2.4.

PART 4. TESTING THE TOOL

STAGE 4.1. DEFINING THE PILOT AREAS

Having developed the Spatial Data Infrastructure of MED Space and having set up the SDIMED GeoNetwork, where the chosen factors and indicators have been implemented according to the two working scales of NUTS 3 and LAU 2, the tool is then ready to be tested. Consequently the members have had to decide upon the regions in which a pilot project would be carried out, which are as follows: Patras, Sicily, Abruzzo, Sardinia, Piemonte, Slovenia, Valencia and Murcia.

In total there are eight pilot projects which have provided a great deal of information about the current and future possibilities of SDIMED.

This is covered in detail in section 2.5.

STAGE 4.2. STANDARDIZING CARTOGRAPHIC PROTOCOL

Pursuant to the INSPIRE Directive, this stage aims at harmonizing the cartographic data model of the participating regions. This model will involve sharing map data symbols and structure so that they can then be passed on, processed and used.

This protocol should provide for:

- The cartography and the geographic information systems of all the MED space regions.
- The previous experience in harmonization acquired by the participating countries and regions.

According to the results obtained so far it is obvious that the INSPIRE Directive has not been implemented very much in many of the MED space regions. This has given rise to serious problems when deciding on what type of common cartographic base should be used; the lack of homogenized cartographic data between certain regions makes it impossible to create a definitive map of the entire MED space that summarizes all the regional cartography.

The solution has been to use standard basic cartography based on the data available from the OpenStreetMap free world map. Even though any other map can be used with the SDIMED viewer.

STAGE 4.3. COMPUTER APPLICATION DEVELOPMENT

The computer application has been developed in the GIS system, on free, client software, which is easy to use in the SDIMED network nodes. The characteristics and protocols of such are covered in detail in section 2.7.

PART 5. CAPITALIZATION AND THE CONTINUATION OF THE TOOL

Work has been carried out in this part to inform and present the public authorities involved with spatial planning with a tool that would enable them to improve the design of territorial planning by evaluating the different policies ahead of time; it would be a way for them to make sure that the results obtained are used effectively and that the tool continues to be developed and implemented.

STAGE 5.1. MEDITERRANEAN INTERREGIONAL FORUM

Having finished the work involved in building and testing the tool, a Forum on the project will be held in Rome, the objectives of such are to:

- Inform all the key agents involved in the spatial planning of the MED space about the methodology and results of the project so that they might consider using it.
- Set up a network to take advantage of the results of the project and to analyse the subject matters in more detail as a supplement to the harmonisation of the cartographic data base and to use of the secondary factors and indicators that have not been given priority in the public participation process.
- Propose the Letter of Intent (Stage 5.2).

STAGE 5.2. LETTER OF INTENT

With regard to the results obtained from OTREMED and SDIMED, the lead partner will prepare a letter that contains details of the basic guidelines, of how to incorporate the results of the project into the regional and local policies and in particular, into the regional geographic information systems of the MED space. This letter aims at getting support from the institutions involved in the spatial planning of the MED space and it will be sent to the European Commission.

Capitalization and development of previous work

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Capitalization of previous work

INTRODUCTION

The Mediterranean is an area of outstanding uniqueness with an extraordinary natural and cultural heritage whose use, unfortunately, has not always been balanced or coherent. OTREMED arises from the need to provide public administrations competent in spatial planning with a tool to facilitate decision–making and management of spatial governance in keeping with the territorial structure and the dynamics inherent in the uniqueness and quality of the Mediterranean space.

OTREMED's objective is to develop a spatial planning tool aimed at improving MED's competitiveness focusing on aspects such as the coordination of land use between bordering regions, the management of population concentration on coastlines, the valorization of the landscape, the adaptation to both climate change effects and to the migratory flows coming from Southern Mediterranean areas, and the development and structuring of tourism.

To reach the project´s aims, one of the first actions OTREMED has to carry out is the Capitalization of Previous Work, aimed at the compilation, analysis and development of existing and in progress studies on the Mediterranean territorial model and MED cartography. Complementariness and synergy with projects in other European programmes need also to be sought.

Within the aforementioned action, OTREMED involves the capitalization of the work carried out in PIC-RM, a project of transnational cooperation developed under Interreg IIIB Medocc Programme as well as the AMAT programme:

- PIC-RM (Projets d'Initiative Commune des Régions Méditerranéennes), was undertaken between July 2005 and March 2007. Its main goal was the identification of structuring projects to be submitted to prospective calls from European programmes in territorial cooperation. So, 11 partners identified 9 tools of a strategic and innovating nature aimed at promoting competitiveness and governance of the Mediterranean regions, in line with the Lisbon Agenda and the Gothenburg Strategy. OTREMED is one of the tools selected by PIC-RM.
- AMAT (Ateliers Mediterranéens d'Amenagement du Territoire), aimed at promoting the governance of the Mediterranean area. It took place between December 2002 and February 2004. It was implemented by 9 key actor partners in spatial planning around workshops to exchange experiences in territorial governance.

The instrument chosen to rationalise decision-making on the use of the territory in Mediterranean regions is known as a Territorial Observatory and its creation is in line with that planned by the EU for its European Territory Permanent Observatories Network (ORATE).

The territorial competitiveness challenges of the Territorial Observatory for Mediterranean Regions which are faced, have been categorised in the following way:

- 1.Revitalisation of the urban system
- 2.Research and Development hot spots
- 3.Urban / rural relationships
- 4.Access to transport
- 5.Access to Information and Communication Technologies (ICT)
- 6.Energy sustainability
- 7.Disaster-related risk prevention
- 8.Sustainable use and management of natural resources
- 9.Sustainable use and management of cultural resources
- 10.Sustainability of regional economic development
- 11.Governability, social participation and quality of life

In order to provide an analysis of previous work, we aimed at compiling a handbook of knowledge for activities on the Mediterranean. To achieve this objective, the priorities and aims for strengthening territorial competitiveness mentioned above were taken into consideration, along with the additional information provided by each partner.

CAPITALIZATION OF PREVIOUS WORKS

The key aim of this deliverable is to form an overall view and to setup the basic axes for the state of the art in previous work already conducted by the Partners up to now in any previous activity or project.

In this process, as a first step we adopted a categorisation of activities already done on the topics of interest, as an evaluation of factors and indicators carried out by Partnership. The first factor in concern is the related projects Partners are involved with and which are already delivered or are ongoing. The terms of Reference used for the categorisation in this case are of EU and regional documents. This basic comparison has been made, taking into consideration the key activities and key outcomes of each project that affects the Regions.

Summary of Studies Collected

Another important issue involved into capitalizing previous work are the studies performed and factors causing some effect in order to provide guidance for future reference and the design of new studies. In order for this approach to be considered completely successful, all studies, even problematic ones, had to be described and depicted. This allowed us to be able to detect any factors which might not be appropriate for the Regions. Additionally, details on existing or ongoing publications and other deliverables were considered to be of great interest for this compilation as well, thus they have been included in the survey.

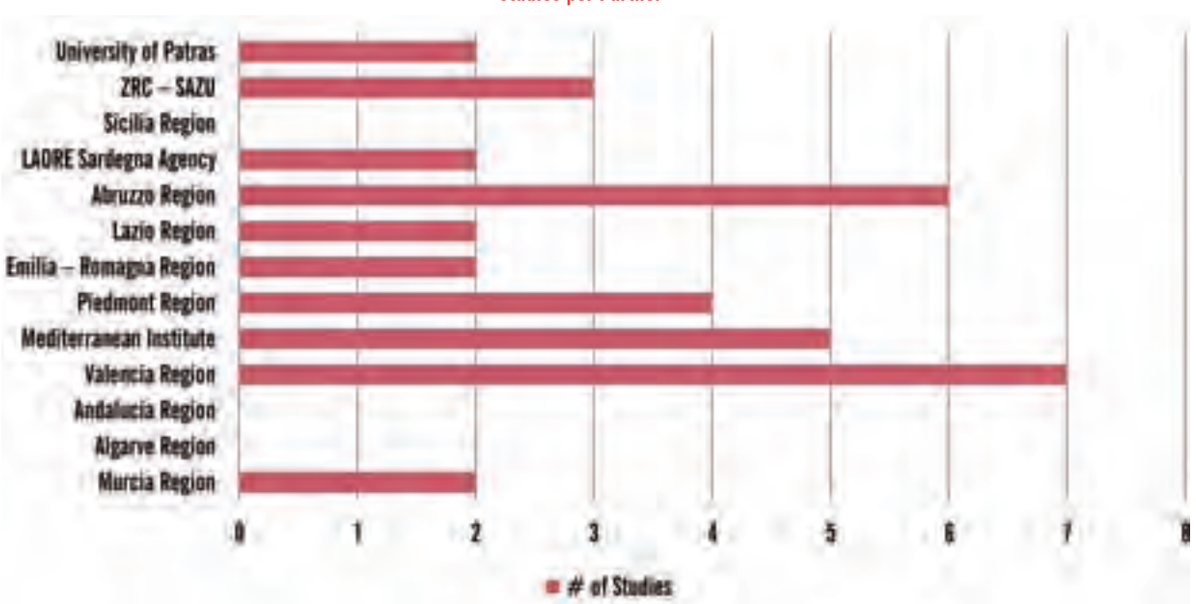
REGION	STUDY	FUNDING	SCALE	KEYWORDS
MURCIA	OMRAT-OTREMED	European, national	local, regional	Territorial observatory, Mediterranean region, territorial competitiveness challenges
	Spatial Management Guidelines and Spatial Plan for the Nor-West Region	region	supra-municipality	multi-nuclear urban development, territorial model, mountain area, bordering space, communication, environment protection, regional integration, structural and strategic actions, functional areas
VALENCIA	The Territorial Strategy of the Valencian Community	region	regional	Governability, social participation and quality of life, Sustainability of regional economic development, Sustainable use and management of natural resources, etc. It's a wide land planning vision, therefore it covers the 11 challenges of competitiveness
	Strategic Territorial Proposals for the Province of Alicante	region	provincial	Revitalisation of the urban system, Sustainability of regional economic development, Sustainable use and management of natural resources, Access to transport. It's a wide land planning vision, therefore it covers the 11 challenges of competitiveness
	The Spanish Mediterranean ARC	region	national, regional	Access to transport, Revitalisation of the urban system, Sustainability of regional economic development, Governability, social participation and quality of life, etc
	Strategies of Territorial Coordination	region	regional, metropolitan	Equipments, public services, accessibility, quality of life, urban areas, etc. It's a wide land planning vision, therefore it covers the 11 challenges of competitiveness.
	Hypothesis of the Valencian Community's Territorial Model	region	regional	Sustainability of regional economic development, Revitalisation of the urban system, Research and Development hot spots, Access to transport, Governability, social participation and quality of life, etc. It's a wide land planning vision, therefore it covers the 11 challenges of competitiveness.
	The Metropolitan Environment of Alacant – ELX: Territorial Acknowledgement	region	provincial, local	Revitalisation of the urban system, Access to transport, Sustainability of regional economic development Disaster-related risk prevention. It's a wide land planning vision, therefore it covers the 11 challenges of competitiveness.
	Mediterranean Strategy of Sustainable Development	region	regional	Sustainable development, natural environment oriented policies, waste recitilization, climate change mitigation, education
MedIterranean Institute	The Mediterranean metropolitan system – White book	Medocc Programme	metropolitan	Metropolitan strategy, polycentrism, cities network, innovation process, economic development, globalization, peripheries
	Innovation, competitiveness, connectivity – I2C project report	Medocc Programme	metropolitan	Attractiveness, sustainable development, concurrency between territories, globalization, innovation
	Report - Motorways of the Sea – Med governance	MED	regional	Motorways of the sea, transport, connectivity, logistic platform, Port authorities, European policy
	Report on potential inter-cluster cooperation in the Med Space	MED	regional, local, metropolitan	Innovation, clusters, sectoral studies: TIC, energy, agro food industry
	Mediterranean Governance Report	MED	regional	Policy-making, decentralization, macro region, transport
PIEDMONT	For a correct management of landscape. Guideline	European, national	regional	Investment in cultural heritage. Natural economic and human heritage in danger, Rural landscape
	Il Piemonte	region	regional	Territorial model, Use of natural resources, Foundations for regional economic growth, Competitiveness of the economic system, Resources for territorial development
	Guidelines for Environmental Equipped Industrial Areas	region	local	Quality certification, energy intensity of the economy, infrastructures for economic development, internalisation of environmental costs, innovation projects
	Valerise mountain resources	European, national	regional	primary energy, final energy, renewable energy, Management plans for heritage sites
EMILIA-ROMAGNA	Regional Territorial Plan		regional	Strategic planning, territorial cohesion, sustainable development, green economy, territorial capital.
	Unitary Programming Document	European, national, regional, local	regional	Develop local assets and endowments, integrating urban and rural areas, urban attractiveness, increasing quality of territorial infrastructures, assets and endowments, human capital, social capital, innovation
LAORE Sardegna Agency	Strategic Plans	european, national	metropolitan	Strategic planning, urban planning, strategic development, Sardinia

REGION	STUDY	FUNDING	SCALE	KEYWORDS
LAORE Sardegna Agency	Strategic Plans	european, national	metropolitan	Strategic planning, urban planning, strategic development, Sardinia
	Regional Landscape Plan	regional	regional	Landscape planning, regional planning, land management, Sardinia
	Planet CenSE: Metropolitan networks	European, national	metropolitan	Polycentric development, metropolitan development, spatial planning, transnational cooperation
UoP	Ktimatologio S.A. – Hellenic Cadastre	private	national	Real estate property, geographical description, cadastral survey, positioning system 1. Revitalisation of the urban system - 1.A Territorial model 3. Urban / rural relationships - 3.A Urban expansion. 3. Urban / rural relationships - 3.B Urban structure
	Plan4All – Geoportal for Spatial Planning	European, national	local, regional	Spatial planning, spatial data sets, INSPIRE directive, land use 1. Revitalisation of the urban system - 1.B Transport infrastructures 3. Urban / rural relationships - 3.B Urban structure 3. Urban / rural relationships - 3.C.Town planning 4. Access to transport - 4.A Transport infrastructures
ABRUZZO	Virtual businesses, real experiences (project)	European, national	Regional	1.C.1 Education 1.C.5 Business, industry and technology 10.C Employment and employment quality 11.A.1 Institutions involved in territorial development 11.F.3 Young people
	URBAN II Pescara (project)	European, national, local	Local	1.A - Territorial model 1.C Availability of equipment and services 2.B Public integration initiatives 2.C Private integration initiatives 3.A Urban expansion 11.A Territorial development coordination 11.B Resources for territorial development 11.C Public participation 11.E Development cooperation 11.F Social integration 11.G Quality of life
	GNISI Project	European, national	National, regional	Metadata, Interoperability, Network services, Data and Service Sharing, Data Specifications, Inspire 7.E.1 Participation in territorial cooperation networks 2.B.3 Innovation projects 2.D Information and communication technologies 5.A Information and communication technologies
	R.I.C.A.MA. Project - Rationale for Integrated Coastal Area Management	European, national	Regional	Coastal defence, Tourism, Transport & Accessibility, Landscapes &Cultural Heritage, Coastal Fishing, Public Access, Second Homes, Pollution, Natural Catastrophes Setting up of ICZM methodological and organisation tools; Technical studies; Management of the river basin sediment budget; Map of administrations and institutions; Geographic Information Systems (GIS); Public awareness activities
	SICORA PROJECT - Support System For The Management Of The Coastal Area of the Abruzzo Region	Regional	Regional	Integrated Coastal Zone Management (projects), Legislation and regulatory measures, Conservation and management of biodiversity, Protection from erosion and degradation, Restoration of damaged soils and plant cover, Data collection, analysis, monitoring, Capacity building, Networking, participation and partnership building
	SIGMA-TER project - Integrated Geographic and cadastral System for the Administrative Monitoring of TERritory	National	Regional	Metadata, Interoperability, Network services, Data and Service Sharing, Data Specifications, Inspire
LAZIO	Atlante E Scenari Del Lazio Metropolitano (Atlas And Scenarios Of Metropolitan Lazio)	National (Ministry of Infrastructure and Transport)	Regional	Regional Policies, Scenarios, Perspectives of Development
	Il Lazio E La Strategia Di Lisbona Rapporto 2008- Lazio And Lisbon Strategy Report 2008	Regional	Regional	Research and Innovation, Monitoring and Indicators, Strategies of Development

Statistical Analysis

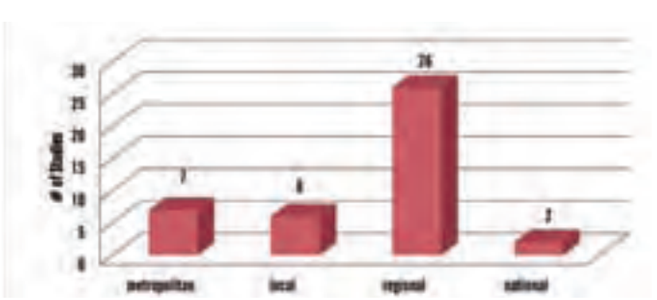
Hereby follows a statistical analysis of the material provided by all partners. The first diagram shows the number of studies that were gathered by each partner, depending on the availability of studies, projects and strategies in each country.

Studies per Partner

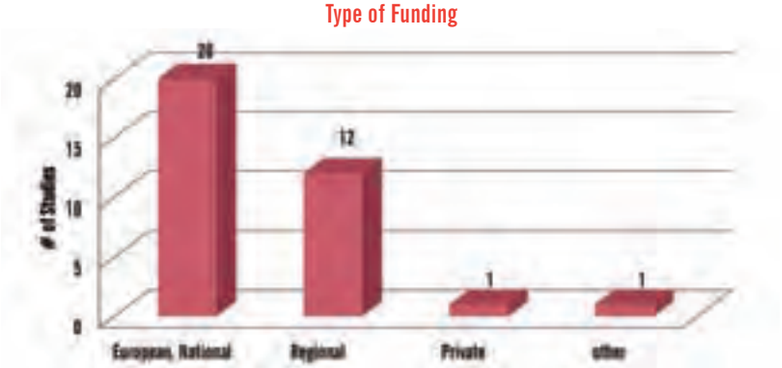


The second diagram presents the scale of application of the collected studies. Some of the studies refer to multiple areas of application, thus they have been included to more than one categories.

Scale of Application



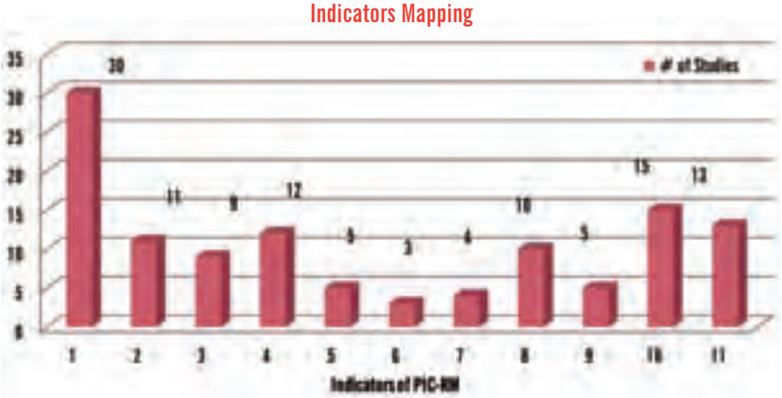
Type of Funding



In the third diagram, studies are categorized according to the type of funding of the corresponding project or strategy.

During the phase of Capitalization of Previous Work, each partner was asked to characterise each collected study, using the most relevant of the indicators describing the 11 territorial competitiveness challenges of PIC-RM. The results are presented in the forth diagram:

Indicators Mapping



From the above diagram, we can easily conclude that the territorial competitiveness challenges that mostly concern the mediterannean countries (this is reflected by the collected studies) are: 1 - Revitalization of the Urban System, 10 – Sustainability of Regional and Economic Development, 4 – Access to Transport and 11 – Governability, Social Participation and Quality of Life.

OTREMED RELATIONSHIP WITH OTHER EUROPEAN PROJECTS

The experience and results of **GIS4EU** and **ESDIN** - also focused on achieving interoperability of spatial information at pan-European level - play a key role in transposition of INSPIRE Directive and implementing rules in the Member States.

ESDIN project is aimed to provide a bridge between theory and practice as far as the implementation of INSPIRE is concerned.

GIS4EU project, in line with INSPIRE, aims to make spatial information more accessible, useful and exploitable by providing consistent and aggregated base reference data on specific themes.

In fact, these projects share common goals with **OTREMED**:

- To satisfy user requirements in areas such as decision making, civil protection, risk management, environment, transport, housing, healthcare, regional development, etc. in an emergent and growing pan-European/MED market.
- To enable the access to geospatially referenced and interoperable data through a ecommerce geoportal:
  i) By developing a minimum set of processing services dealing with interoperability
  ii) By aggregating this interoperable data through development of web-based services for several Annex I INSPIRE themes at different levels of resolution, in a cost-effective and efficient way.
- To ensure and promote organisational collaboration and development.
- To test INSPIRE implementing rules and guidelines in a real scenario and help to improve them.

The project, driven by EuroGeographics, can also be considered as a process to adapt its pan-European products to the new scenario brought on by INSPIRE transposition.

The main aim of the **Plan4All** – European Network of Best Practices for Interoperability of Spatial Planning Information - project is to harmonise spatial planning data and related metadata according to the INSPIRE principles.

Therefore, **Plan4All** and **OTREMED** are facing common issues related to

- Spatial Data Infrastructure harmonization
- standardisation of related data themes from INSPIRE annexes (land cover, land use, natural risk zones etc.) .

GIS4EU – BRIEF PROJECT ANALYSIS

General Information

In Europe, spatial information is characterized by lack of harmonisation between datasets at different geographical scales, fragmented datasets and sources, gaps in availability and duplications of information.

The GIS4EU project aim was to provide base cartography datasets:

- *administrative units,*
- *hydrography,*
- *transportation networks*
- *elevation themes*

for several regions of Europe and to ensure its cross scale, cross language and cross border interoperability and accessibility according to the standards and implementation requirements of the INSPIRE Directive (2007/2/EC).

The GIS4EU project started successfully on 1st November 2007 and lasted for 30 months. The total project budget amounts to 4,2M €. It was co financed by the European Commission (contributing 50% of the total costs) within the eContentplus programme.

GIS4EU project was coordinated by the CORILA Consortium for Coordination of Research Activities concerning the Venice Lagoon System (Italy).

GIS4EU aims at organizing a system to share base cartography layer in order to make accessible and generate a common level of sharing information, without building a central database but sharing data through standard services.

The approach consisted of the development of a common data model plus harmonisation, aggregation and data exposition rules and guidelines in order to enable access to consistent and homogenous reference data provided by cartographic authorities from different countries and levels (national, regional and local) without building a central database and service.

At European level GIS4EU has paid particular attention to the following relevant issues:

1. to maintain the platform's independence: the aggregation process was based on the application of the interoperable standards guaranteeing the platform's independence: this enabled a harmonised framework amongst different public authorities in Europe in different MS at different levels (EU, National, regional and local).
2. to accessibility: the common information point was created paying attention to accessibility criteria: this would allow its content to be used by all the citizens

GIS4EU impact

The GIS4EU project strictly observes and follows the technical rules defined by the INSPIRE legislation to set up a European Spatial Data Infrastructure.

After three years, through a daily exchange of opinions, step by step, useful results were obtained.

As the Final Report of Gis4eu declares there isn't in fact any professional figure, a particular skill, or a sector of competence, which can be considered as enough able to completely face alone the various issues presented by the Directive or required by the creation of an SDI. The fact that the data should first be translated into information, and then into knowledge, necessarily requires a 'multiple' or multidisciplinary approach, or rather a multi-institutional one.

So a software, the data and the reading ways of a territory are not sufficient to interpret the Directive, as it is necessary to create an infrastructure.

Therefore, the competences, the working team, the technical skills in the different sectors and the specific knowledge of the Directive technical elements, as well as its methodologies, are very important. So, we are not speaking only of information technology or GIS, it is not only cartography or integration between different systems.

The GIS4EU project is accelerating the knowledge of the INSPIRE technical rules inside the data providers.

GIS4EU made available an engineered methodology to apply it, in the real context, and provide the operational test that the INPIRE goals are feasible and reachable. So this, proving a European common data model and standards services that can be used by both the public and private sector is feasible.

As mentioned above, GIS4EU aim was to organize a system to share base cartography layer as far as administrative units, hydrography, transportation networks and elevation themes are concerned. These cartography layers could possibly offer Otremed the cartography base of the following indicators describing the territorial competitiveness challenges of PIC-RM:

GIS4EU Cartography Layer	PIC-RM Territorial Indicator
Administrative Units, Hydrography, Transportation Networks, Elevation Themes	1.Revitalisation Of The Urban System-1.B Transport infrastructures
	3. Urban / Rural Relationships - 3.B Urban structure
	3. Urban / Rural Relationships - 3.C.Town planning
	4. Access To Transport - 4.A Transport infrastructure

ESDIN – BRIEF PROJECT ANALYSIS

General Information

The European Commission's ambition to build a European Spatial Data Infrastructure (ESDI) on the National Spatial Data Infrastructures in Member States, for which INSPIRE is the legal instrument. This project will further this by focusing on helping Member States, candidate countries and EFTA States prepare their data for INSPIRE Annex I themes and improve access to them. Specifically the project will:

- Aggregate data through development of web based services for several INSPIRE themes at different levels of resolution from the European to the local level;
- Implement services which will support the aggregation of 'interoperable' data in a more cost effective and efficient way;
- Build sustainable best practice networks to ensure the organisational development necessary to achieve the goals of the project and its continuation afterwards;
- Spread best practice in the integration of local (large scales) reference information with pan-European (medium/small scales) reference information, and interoperability with other data themes.

Test INSPIRE Implementing Rules and specifications in a live operational environment and recommend improvements where identified.

The best practice network (BPN) ESDIN officially started on 1 September 2008 with a duration of 30 month. For this reporting period (from mid-term review to end of the project), the objectives have been fully met and all agreed Deliverables have been submitted. The Description of Work proposed that the ESDIN products and services developed in the project would cover ten EU Member States. In fact, the services provide access to 50 INSPIRE data sets covering 5 INSPIRE themes of ten European Countries. Two pan European datasets are provided by two project participants (BKG, EDINA).

The ESDIN services will thus form an important part of implementing the INSPIRE Directive's data and services requirements for Annex I themes:

- *Administrative Units*
- *Transport Networks*
- *Cadastral Parcels*
- *Hydrography*
- *Geographical Names*

Only addresses and protected sites were not covered by ESDIN. Annex I and II mostly contain information considered to be reference data. This is the data that everyone uses to connect information to a location. The National Mapping and Cadastral Agencies have the key role in the provision of reference data. This data must be reliable and the source has to be known. Therefore this data can be considered as a key element in SDIs.

The project organized a web service architecture to share spatial data from mapping agencies in order to make it easily accessible and interoperable. The INSPIRE data specifications are the basis for the extension of more data from the NMCA's that are relevant for the users. Data are shared through service architecture using open standards and building a central data cache to improve data access performances. The project developed common data specifications and open source tools for common standards based on INSPIRE directive. Specific services (applications) have been implemented to enable access and apply on-the-fly harmonisation of data from various sources as well as data generalization.

In the ESDIN quality reference model there is a groundbreaking approach for a data quality web service based on Quality Model guidelines. The Quality Model content makes extensive use of the internationally recognized ISO standards for quality, such as the identification of the data quality elements and sub elements (ISO 19113) and quality measures (ISO 19138). It is also valuable for the evaluation of the spatial data, (procedures according to ISO 19114) and the production and metadata recording process (ISO 19115 or quality report).

At the close of the project, ESDIN achieved all of its major objectives in a timely manner, that the consortium has proposed and implemented a follow-on sustainability approach through 2012 via key partner Eurogeographics to ensure future applicability of the results within the planned European Location Framework (ELF).

ESDIN impact

ESDIN has laid the foundations for a European Location Framework (E.L.F.). This will enable cross-border information to be geographically referenced and allow citizens, businesses and governments to gain maximum benefit from the re-use of existing national datasets.

Intellectual property rights remain an issue, but one that the project and consortium cannot resolve, nor could be expected to resolve. The licensing policy guidelines and an end user license model appropriately show how to solve these issues in a step by step manner. However, more efforts have to be used to implement a European licensing policy at all NMCA's. The planned ELF will be the right forum to continue this work.

The technical solution adopted also offers a 'security' function by which access to restricted ESDIN data is monitored and restricted as required by agreement(s) with current data providers to the system. Further proof that the project "contributes significantly to achieving the eContentplus objective of making digital content in Europe more accessible, usable and exploitable" will arise during the implementation of ELF, as more mapping agencies will potentially adopt the tools made freely available via the project.

Indications from potential users, such as Eurostat, are encouraging, but

coverage (ESDIN for all EU Member States) remains a key issue. Eurogeographics intends to include the ESDIN results as part of their future pan-European service infrastructure, which would help ensure that future take up of the project's results justified the expenditure on the project via the eContentplus programme.

The ESDIN Consortium of NMCAs, academic institutions, technology providers, stakeholders and users of location data, based its research on user requirements:

- Consistent geospatial reference data and identifiers for a much stronger framework for analysis
- Clear updates and indicators of validity, such as the data origin, to aid integration with user datasets
- Trustworthy, quality-assured data to eliminate the need for verification at the user end
- Data from consistent processes to ease the integration process with users' own datasets
- An "open" policy for data.

ESDIN has responded to these issues with:

- A modular approach to harmonising licences allowing users to have comparable terms for the actual use of data and services and providers to retain the licence elements that national jurisdictions require to be different
- The Geo Product Finder – combining legal and technical resources to provide the "missing links" in finding and utilising data and services without replacing what is already working well.

ESDIN could possibly offer Otremed the appropriate infrastructure of the following indicators describing the territorial competitiveness challenges of PIC-RM:

ESDIN Themes	PIC-RM Territorial Indicator
Administrative Units, Transport Networks, Cadastral Parcels, Hydrography, Geographical Names	1.Revitalisation Of The Urban System-1.B Transport infrastructures
	1.Revitalisation Of The Urban System-1.A4 Land Use Distribution
	3. Urban / Rural Relationships - 3.A Urban expansion
	3. Urban / Rural Relationships - 3.B Urban structure
	3. Urban / Rural Relationships - 3.C.Town planning
	4. Access To Transport - 4.A Transport infrastructure

PLAN4ALL – PROJECT BRIEF ANALYSIS

General Information

The main aim of Plan4all project is to harmonise spatial planning data and related metadata according to the INSPIRE principles.

Plan4all is a European project co-funded by the Community programme eContentplus, started on 1 September 2008 with duration of 30 months.

Spatial planning acts between all levels of government both in bottom-up and top-down directions. National, regional and local authorities face important challenges in the development of territorial frameworks and concepts every day. The situation is complicated by the diversity and overall complexity of spatial planning.

Spatial planning is a holistic activity. All the tasks and processes must be solved comprehensively with input from various sources. It is necessary to make the inputs interoperable. This allows the user to search the data, view them, download them and use them with help of IT technologies.

Plan4all will contribute to make spatial planning data more accessible, usable and exploitable. These are also the main goals of the Community eContentplus programme.

The Plan4all project should contribute to standardisation in the field of spatial data from spatial planning point of view. Its activities and results will become a reference material for INSPIRE initiative and other related projects. Plan4all is focused on the following 7 spatial data themes as outlined in Annex II and III of the INSPIRE Directive3:

- Land cover
- Land use
- Utility and Government services
- Production and industrial facilities
- Agricultural and aquaculture facilities
- Area management/restriction/regulation zones and reporting units
- Natural risk zones

Plan4all is a Best Practice Network. It should profit from orchestration of available solutions (best practices) in the field of spatial planning and SDI (Spatial Planning Infrastructure). The main project aims are to:

- Promote Plan4all and INSPIRE in countries, regions and municipalities;
- Design the spatial planning metadata profile;
- Design the data models (application schemas4 in the INSPIRE

terminology) for selected spatial data themes related to spatial planning;
- Design the networking architecture for sharing data and services in spatial planning;
- Validate the metadata profile, data models and networking architecture on local and regional levels;
- Establish a European portal for spatial planning data;
- Deploy spatial planning data and metadata on local and regional level.

The Plan4all project covers 15 European countries. The existing content for spatial planning exists in all of these countries and the project will demonstrate possibilities how this content could be standardised. Annex I provides a list of the digital content contributed to the project.

In general, the technological and standardisation part of the work will be separated into three parts:

- 1. Description, summation, optimisation and harmonisation of European standards of data for spatial planning from point of view of metadata, data models and networking services.
- 2. Defining common procedures and methodologies for sharing and utilisation cross Europe of new spatial planning data standards for the EU.
- 3. Methods of monitoring SDI utilisation for spatial planning.

Plan4all will also have important networking activities:

- 1. Building European cluster for SDI in spatial planning under umbrella of ISOCARP and EUROGI. The cluster will use a model based on national clusters ad hoc developed by founding consortium members and other subjects which will join the network.1
- 2. To support exchange of best practices trough interactive workshops, but also using web technologies.

Plan4all impact & sustainability

The problem of spatial planning, its governance, participation of all stakeholders and open decision processes is very important in Europe. With the EU enlargement its importance increases. There exist many cases, where low participation at all levels of government, low involvement of NGOs, stakeholders and citizens lead to non transparent processes, which in future phases of implementation can effectively block important investment opportunities.

The conception of planning is interaction both between various levels of government in a region and between public authorities, business and citizens. A specific regional framework allows parties to weigh the influence of investment or administrative control by public agencies. At the same time, there are the benefits of legitimacy and transparency and public participation.On the other hand, Spatial Data Infrastructures (SDIs) are being created thanks to the INSPIRE Directive, and these SDIs are beginning to open doors to the release and exploitation of key Public Sector Information (PSI). Common spatial data catalogues can be queried from multiple locations and thus provide a consistent coverage and availability of spatial data to all relevant decision makers, even if linked virtually. Spatial data duplication is minimized and decision contexts are harmonized.

The Plan4all solution facilitates cross border use and data integration. The project consortium mainly consists of administrative bodies (content providers) which have significant experience in collecting, storing and publishing spatial data. The European dimension of the Plan4all initiative is to put together experiences for creation of a consensual platform and identifying commonly agreed tools.

The main aim of Plan4all project is to harmonise spatial planning data and related metadata according to the INSPIRE principles, so the Plan4all Data Themes could represent the following indicators describing the territorial competitiveness challenges of PIC-RM:

Plan4all Data Themes	PIC-RM Territorial Indicator
Land Cover, Land Use, Utility and Government services, Production and industrial facilities	1.Revitalisation Of The Urban System-1.B Transport infrastructures
	3. Urban / Rural Relationships - 3.B Urban structure
	3. Urban / Rural Relationships - 3.C.Town planning
	4. Access To Transport - 4.A Transport infrastructure

Project	PIC-RM Territorial Indicator					
	1.Revitalisation Of The Urban System- 1.A4 Land Use Distribution	1.Revitalisation Of The Urban System- 1.B Transport infrastructures	3. Urban / Rural Relationships - 3.A Urban expansion	3. Urban / Rural Relationships - 3.B Urban structure	3. Urban / Rural Relationships - 3.C.Town planning	4. Access To Transport - 4.A Transport infrastructure
GIS4EU	-	X	-	X	X	X
ESDIN	X	X	X	X	X	X
Plan4all	-	X	-	X	X	X

CONCLUSIONS - SUMMARY

Nowadays, the issue of territorial competitiveness becomes increasingly important for regional development policies. There is no doubt that much work has been done or is being currently conducted in most regions of the EU and the Mediterranean in particular. The aforementioned projects indicate that territories have done a lot to increase their competences, taking into consideration both traditional factors and the new ones. In order for them to increase their attractiveness and competitiveness, individual regions need to work together towards establishing a fruitful interaction which will bring new investments and will allow them to establish a place in the international market.

The spatial planning tool to be created aims exactly at improving MED's competitiveness as a whole. It will focus on aspects of great importance, such as the coordination of land use between bordering regions, the management of population concentration on coastlines, the valorization of the landscape, the adaptation to both climate change effects and to the migratory flows coming from Southern Mediterranean areas, the development and structuring of tourism. Even the regions that have already addressed some of these important issues will benefit from the process, as it will allow them to revisit the work that has been done, evaluate it and compare it to the other regions. All the participants are anticipated to profit from the process as well as from the results.

After a brief analysis of three projects, GIS4EU, ESDIN and Plan4all, the following table indicates the PIC-RM territorial indicators that these projects have dealt with and they may offer OTREMED a satisfactory base to work on.

All these programmes propose different approaches to deal with the same type of problems, based on the experience of a wide range of professionals from different countries. Hence the suitability of compare and contrast the different results and conclusions obtained from these projects, taking profit of the interdisciplinary and varied context they are based on.

Therefore, all these projects are the best place to promote discussion between European/MED experts from different area domains and Member States, and also to share best practices to prepare the way to GI interoperability and Spatial Data Infrastructure harmonization. Thus, they must contribute each other joining efforts and analysing their conclusions together in order to consider them as a whole while INSPIRE is being implemented to becoming a reality.

Med space territorial characterization

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Representing the Mediterranean and its European component

Since the early stages of the Otremed project proposal, phase 3.3. [Table 1] has seemed to be a crucial phase, for its importance, the vast scope of investigation, and the ambiguous and inclusive nature of the issue itself.
The identification of the Mediterranean space varies depending on the type of approach; similarly, the studies on the Mediterranean space are many and from different perspectives. In fact, each study focuses on the diversity and peculiarities that, more than anything else, aim at building a mosaic of differences rather than a homogeneous space structure than can be identified as a unitary system.
This aporia becomes all the more evident if we try to represent the Mediterranean space as a macro-region. From this perspective, the Mediterranean is a geographical area where different worlds overlap the southern European arch, the northern African front, the western shore of the Near East, and the southern western side of the Balkans. All these regions converge in a common geographical space, but at the same time, they are also the result of different economic and socio-political trends. In fact, it is impossible to consider the Mediterranean from a unitary perspective, without taking into due account the fact that such space also belongs to different contexts and has different logics.
At the same time, the need for a representation and an understanding of the Mediterranean space as an area with its own identity and as a common scenario of interactions between converging or conflicting economies, cultures, policies and economic interests remains a priority.
If it is true that the Mediterranean space is now characterized by a fragmentation of policies, it is also true that in this area different identities exist and persist. These identities are themselves a resource, and it is necessary to work for building a shared vision for the future and for sharing converging policies aimed at fostering sustainable development, environmental protection, harmonization of cultures and the protection of identities.

STUDY OF THE ENVIRONMENTAL AND SETTLEMENT CHARACTERISTICS OF THE MEDITERRANEAN MACRO-REGION TO IDENTIFY A TERRITORIAL MODEL

The biogeographical region and the environmental risk
As to the environmental aspect, the analysis focused on the Mediterranean region as a unified, biogeographical region. [Figure 1]
According to the monitoring studies carried out by the international agencies for environmental protection the Mediterranean, space is, from an ecological point of view, very fragile and at risk of environmental crisis. The Mediterranean space is highly exposed to the aggression caused by the human pressure of urbanization, especially in the coastal areas, and by industrial and logistical activities and fishing.
In the Otremed project these aspects were translated into issues, i.e. topics. Furthermore, they became the subject of questionnaires submitted to the participating regions.

The settlement system

As to the description of the territorial and urban systems, it is necessary to take into account that the Mediterranean basin is an area where different spaces, characterized by great diversity and different trends, converge. Its description, therefore, takes into account the subdivision of the Mediterranean into different geographical areas according to some criteria established by previous research studies, identifying some characters that are relevant for the construction of the observatory.

Table 1. Building process of Phase 3.3 model
Figure 1. The Mediterranean biogeographical region

OTREMED STRUCTURE 3.3		ACTIVITIES	OUTCOMES
1.Layout	Summary of previous work and studies	Analysis of the outcomes of PICRM documents and the Basic criteria document issued by Murcia Region	First assessment of the documents against the development of EU policies and strategies
	The 11 competitiveness challenges or territorial pillars elaborated in the PICRM project in line with the and Gothenburg agendas.	Assessment and updating regional and MED priorities, systematization and harmonization of factors and indicators documents delivered by Murcia Region	Overview of MED and EU documents recently issued; updating selection and re-organization of the challenges in new topics
2. Comparative analysis stating the variety and complexities inherent in MED space.		Assessment of the topics and vectors among Partnership	Questionnaire (Focus Document) submitted to the partnership, data and information collection
3. Territorial diagnosis		Elaboration of questionnaire fulfilled by partnership	evaluation of results, definition of characters of the Mediterranean at regional level.
4. Identification of current and expected Territorial Models		Scenarios on target models	Comparative analysis with ESPON models
5. Identification of the proposed Territorial Model		Target model based on the joint activities carried out by Piedmont Region (Factors) and Sicily Region (indicators)	Statement for a Regional Territorial observatory for the European Mediterranean Regions

The Latin Arch

In general, the urban structure of Latin cities preserves the historical matrix - mainly medieval - but also the centrality of municipal squares.

Historically and until recently, major cities, i.e. those that for their development had relied on the main ports, were the pillars of the Mediterranean space.

However, at present the situation is different. The development of settlement and tourism models and the strengthening of connections between the local and global economy are driving the evolution of the settlement models of all the cities of the Latin Arch towards an urbanized continuum, where new centres that can radically change the old hierarchy expressed by the traditional centrality of the consolidated city emerge.

The Adriatic through

The Adriatic basin is quite diverse. The differences are evident in the Italian part and in the Balkans. On the Italian side, the structures of the manufacturing companies of the so-called third Italy - characterized by a strong integration between town and country, but also by continuous settlements, which are the expression of a large facility – are particularly outstanding. All connections between the houses, places of production, trade, and tourism infrastructure are located in a corridor that runs along the coast and which tends to form a sort of arch of a linear coastal town between the medium and high Adriatic Sea (Adriatic coast).

The cities located on the Italian side of the Adriatic basin, unlike those of the Latin arch, show their continuity of urban expansion, i.e. a model in which urban environments, between continuity and fade, give way to hybrid spaces where it is difficult to distinguish between centres and outskirts.

Instead, in the cities of the former Yugoslavia and Albania on the Adriatic Sea the model is different. In this case, due to a more fragmented coastline, with fewer coastal plain areas, the settlement model is highly fragmented. This model has been affected by past conflicts, which took place in Croatia, Bosnia and Serbia, but also by the difficult transition to democracy in Albania.

The future development trend along the Adriatic corridor seems to be the development of tourism, which could be the real key to set a new Adriatic Koine.

The Maghreb front

Until the 50s in Maghreb cities were the result of a combination of Medieval-type Islamic cities and the colonial transplantation of European cities of the nineteenth century; however, today the situation is much more complex.

After the growth of the 60s, Maghreb cities became a mosaic of irregular pieces. The urban landscape of North African cities is not dominated by and from the centre but by and from the suburbs. The outskirts are often characterized by the presence of public facilities, college campuses, hospitals, parks. In fact, North African cities seem to be effectively represented by the image of a mosaic of different elements.

The Libyan-Egyptian inflexion

The so-called Libyan-Egyptian inflexion is characterized by different settlement structures.

In Libya, urban development is influenced by its Italian colonial phase, and the space is increasingly character-

Figure 2. Mediterranean geographic subdivision and Population distribution in millions (ONU 2003)

ized by the evolution of economic development.
In Egypt, the hub is Cairo, truly a megalopolis affected by problems that are completely different from those affecting the other Mediterranean cities.
The majority of the Egyptians live near the Nile. This area is characterized by the typical contradictions of contemporary Arab cities: the spontaneous spreading of settlements, the contemporary city and the new settlements.

The Middle East facade

The Middle East side is characterized by a network structure. This area includes the centres, whose morphology allows for recognizing urban and rural areas. These centres are of different sizes, each with its own functional specialization.
In many cases, these are the great cities of the past, such as Damascus, Aleppo, Homs, Syria, Beirut.
All these cities have something in common: urban redevelopment programmes. The urban redevelopment of the Damascus and Aleppo's historic centres was successfully completed , and Beirut began rebuilding after the Lebanese civil war.
In many cases, the traditional places of Medina and the new spaces of modernity overlap. The coastal landscape is dotted with settlements that are generally poor and, sometimes, still characterized by intensive agriculture. Immersed in an unfettered realm are some tourist resorts.
Unfortunately, in many parts of the territory, political instability, due to the conflict in the Middle East, makes the future development particularly uncertain. These uncertainties are reflected in the urban structure, such as in Lebanon and Gaza, consisting of buildings that seem to be suspended between the preservation of what has not yet been destroyed and the expectation of a more stable future.

The Anatolia-Balkans bridge

The Anatolia-Balkans bridge combines the Byzantine-Ottoman model with Western models. The merger of Turkey and Greece with European models generates the greatest contradictions among the new elements of the modern urban landscape.
These contradictions are to be found in the places where tourist development took place. These places tend to transform traditional, stratified settlement models through long-term historical processes.
However, while in Turkey the coastal landscape is still rather intact, Greece seems to have changed due to the pressure of mass tourism and a massive development of settlements.
This region's most iconic cities, i.e. Athens and Istanbul, summarize these differences. Athens is the expression of the modern pseudo-rational model. Istanbul, instead, is a polymorphic model where sophisticated places and the urban chaos coexist. Similar contradictions can be found in Thessaloniki, in Greece, and Izmir, in Turkey.
The difference between modernization and tradition is less strong in the smaller settlements of the Aegean Sea, due to their relationship with the sea. This area is characterized by the presence of a few large urban centres with a higher level of tertiary activities and tourist settlements which tend to gradually change the traditional settlements, showing that the rural culture is disappearing. [Figure 2]

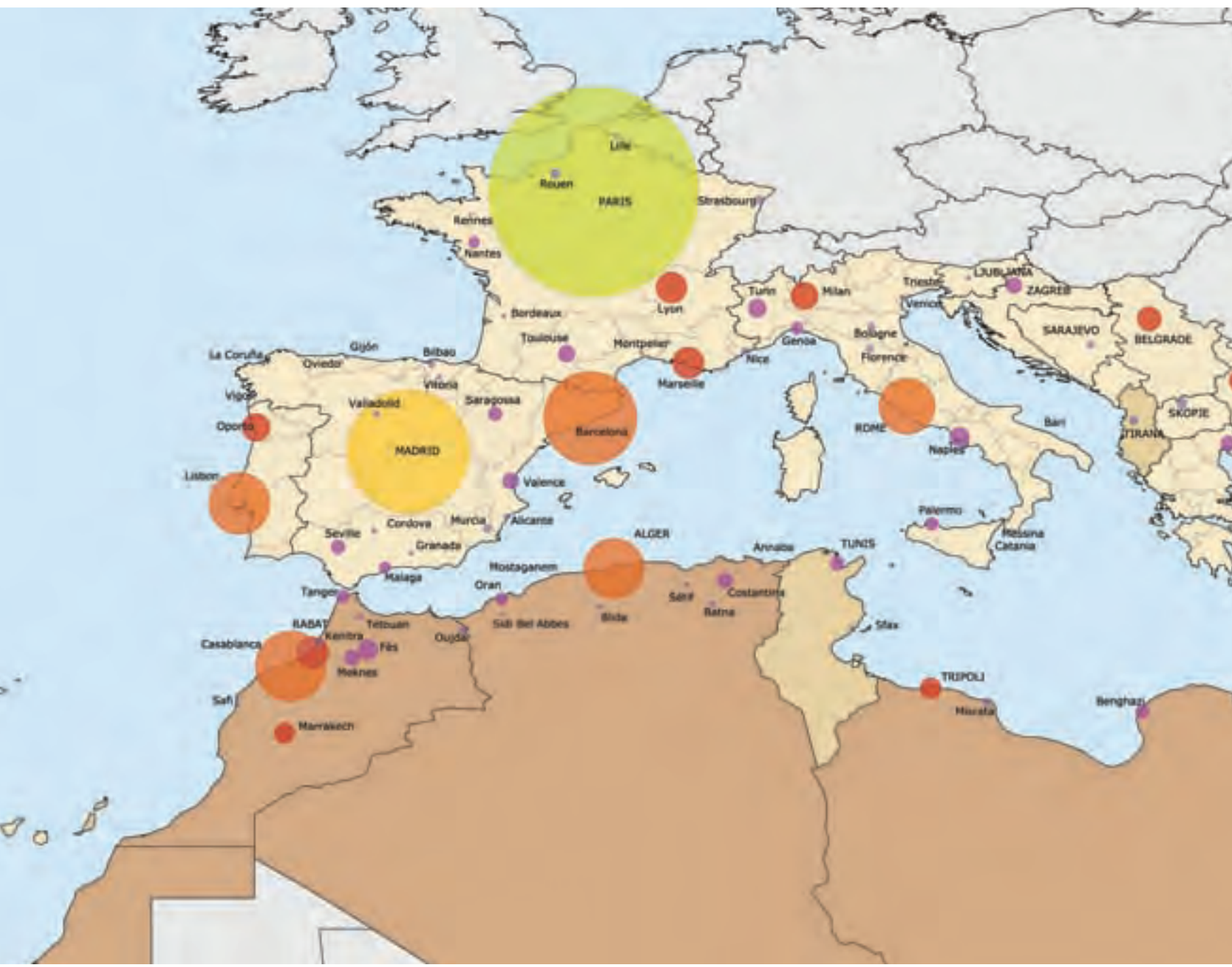

Natural growth rate < 5‰
Natural growth rate 6-18‰
Natural growth rate >19‰
13 million of inhabitants
8 million of inhabitants
5 million of inhabitants
2 million of inhabitants
1 million of inhabitants
0,5 million of inhabitants
0,2 million of inhabitants
Lille
Rouen
PARIS
Strasbourg
Rennes
Nantes
Bordeaux
Lyon
Turin
Milan
Trieste
LJUBLJANA
ZAGREB
Venice
Bologne
Genoa
Florence
SARAJEVO
BELGRADE
Toulouse
Montpelier
Nice
Marseille
La Coruña
Gijón
Oviedo
Bilbao
Vitoria
Valladolid
Saragossa
Barcelona
MADRID
Oporto
Lisbon
Valence
Cordova
Murcia
Alicante
Seville
Granada
Malaga
Tangier
RABAT
Kenitra
Tetouan
Fès
Meknes
Casablanca
Safi
Marrakech
Oujda
Sidi Bel Abbes
Oran
Mostaganem
ALGER
Blida
Sétif
Ratna
Costantina
Annaba
TUNIS
Sfax
TRIPOLI
Misurata
Benghazi
ROME
Naples
Bari
Palermo
Messina
Catania
TIRANA
SKOPJE

Figure 3. Metropolises with more than one million of inhabitants (Plan Bleu 2005)

1 Commission of The European Communities, Brussels, 2008, Sec (2008), Regions 2020, An Assessment of Future Challenges For EU Regions.
2 EEA, 2010. The European environment - state and outlook 2010: synthesis. European Environment Agency, Copenhagen.
3 First ESPON 2013 Synthesis Report, New evidence on Smart Sustainable and Inclusive Territories.

CRITERIA USED FOR DETERMINING THE MODEL

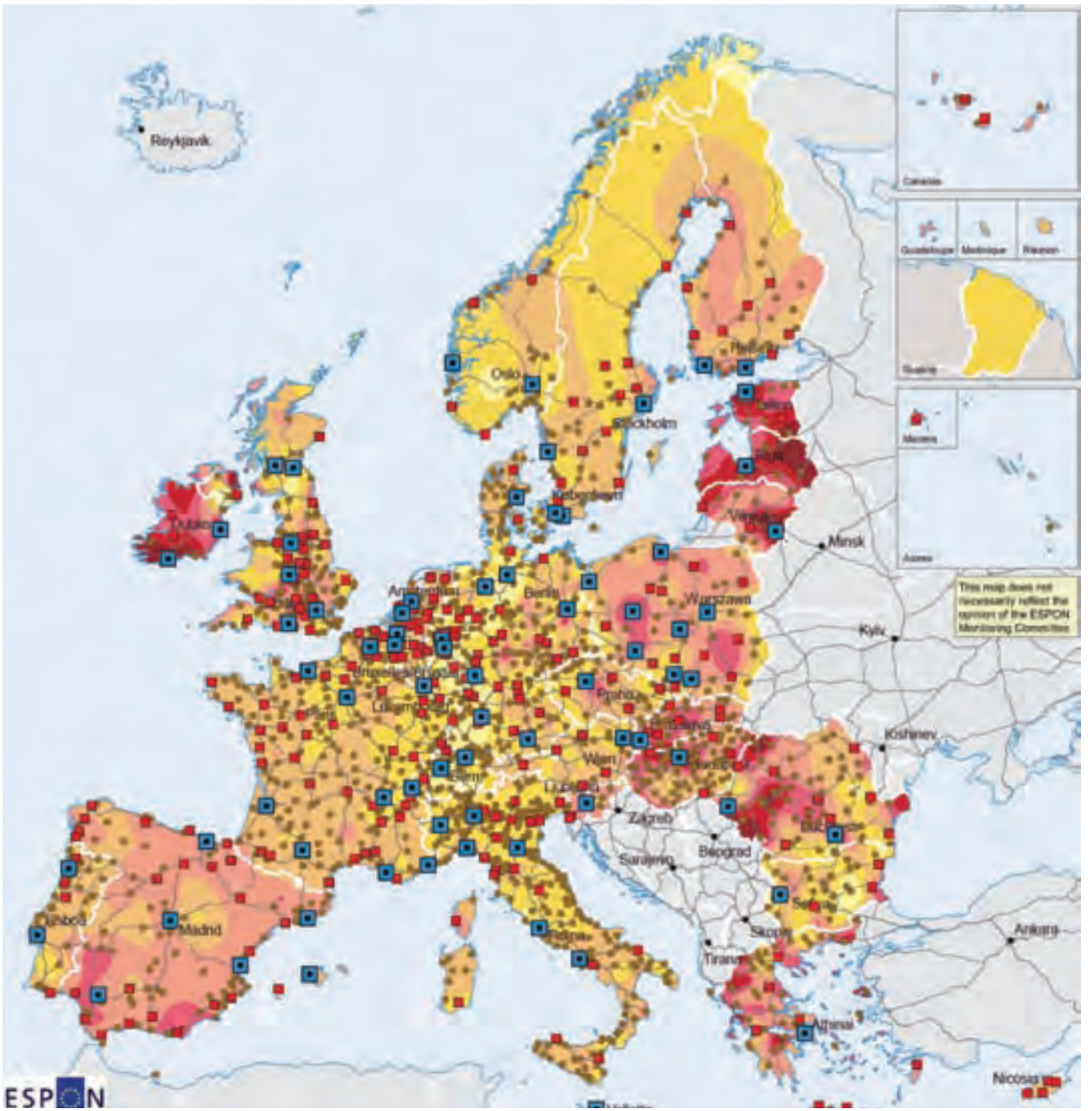
The characterization of the macro Mediterranean region, according to the objectives of Otremed, is aimed at identifying the main factors that are useful to build a development model based on the specificities of the Mediterranean. This development model is based on two basic models.

The first is the strategic vision, which is based on some trends, expressed through synthetic indicators (strategic indicators).The key concept is based on competitiveness built on action lines; see the four key topics in the Regions 2020[1] report: globalization, demographic change, climate change, energy challenge, or action plans such as the UNEP MAP, and last but not least, the strategic lines as stated by the MED space programme and ENPI programme.

The second is the specific description of the Mediterranean, based on a vision resulting from the European and the Mediterranean descriptive models. This construction is based on the holistic models described in documents such as Plan Bleu, documents of the European Environmental Agency such as SOER[2], and the instruments of EU territorial description as ESPON[3].

Both research lines require a two-track analysis: the first is aimed at fulfilling the need of building a vision of the Mediterranean global observatory, capturing the specificities of this macro area: characters, differences, crisis and scenarios. In this respect, the reference material is extremely vast. The second is linked to the regional identity of the Otremed Project, which, in other words, is the added value of the MED project. The idea is to build an observatory starting from the regional point of view, through a direct survey of the topics, issues and problems the participating regions are affected by. Besides the study of this literature, the topics, issues and problems of the regions were also detected through the questionnaire 'Focus Document on Regional Characterization of Mediterranean Space'. **[Figure 3]**

MAP 1: Main economic structures of the European territory



Average yearly development of GDP per capita in Purchasing Power Standards in percent 1995 to 2003 *

- to below 2
- 2 to below 4
- 4 to below 6
- 6 to below 8
- 8 to below 10
- 10 to below 12
- 12 and more
- no data

* Romania 1998 to 2003

Functional Urban Areas (FUAs)

- Metropolitan European Growth Areas (MEGAs)
- Transnational / national FUAs
- Regional / local FUAs
- Highways of European level

The functional urban areas are an important territorial structure in Europe. An ongoing ESPON Project is doing further work on their classification. New results will be available by the end of 2006.

Regional level: NUTS 3
Origin of data: GDP: Eurostat, MEGA: ESPON 1.1.1 Nordregio

Source: ESPON database

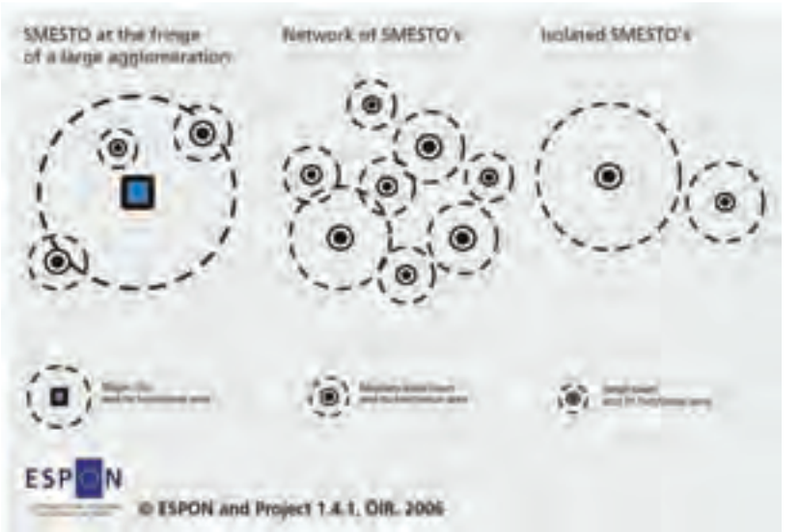


Figure 4. Main Economic structures in the European territory (ESPON 2006)
Figure 5. Typology of small and medium sized towns SMESTO (ESPON 2006)

THE CHOICE OF THE EUROPEAN SPACE REPRESENTATION SYSTEM: FROM THE LISBON STRATEGY TO EUROPE 2020

At its conception stage, Otremed took the 11 factors of competitiveness (the so-called competitiveness pillars) as reference criteria to measure the level of regional competitiveness,

This type of approach, built on the Lisbon Strategy principles, has been gradually losing relevance with the advent of the global crisis, and led to the development of a European strategic programme based on a different approach focusing on larger issues.

As a result, a general approach was followed, inferring some criteria for analysis and spatial representation; for the description of environmental trends in the Mediterranean biogeographical region, the Plan Bleu and the European Environment Agency's studies were also used.

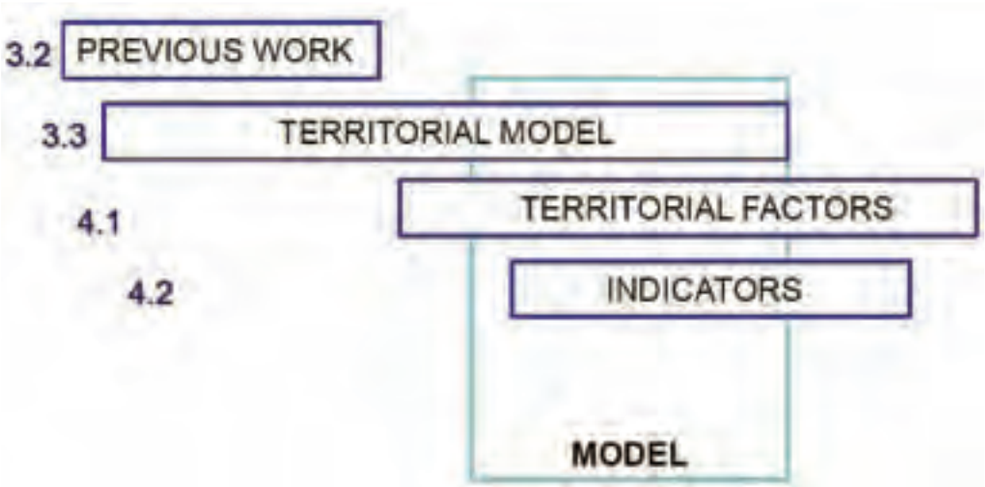
A specific study was used to carry out a critical analysis of ESPON description categories. The analysis focused on the validity of the geographical categories used in the early ESPON studies: MEGAs, FUAs, PUSH areas, which are not always capable of faithfully reproducing the European Mediterranean space.

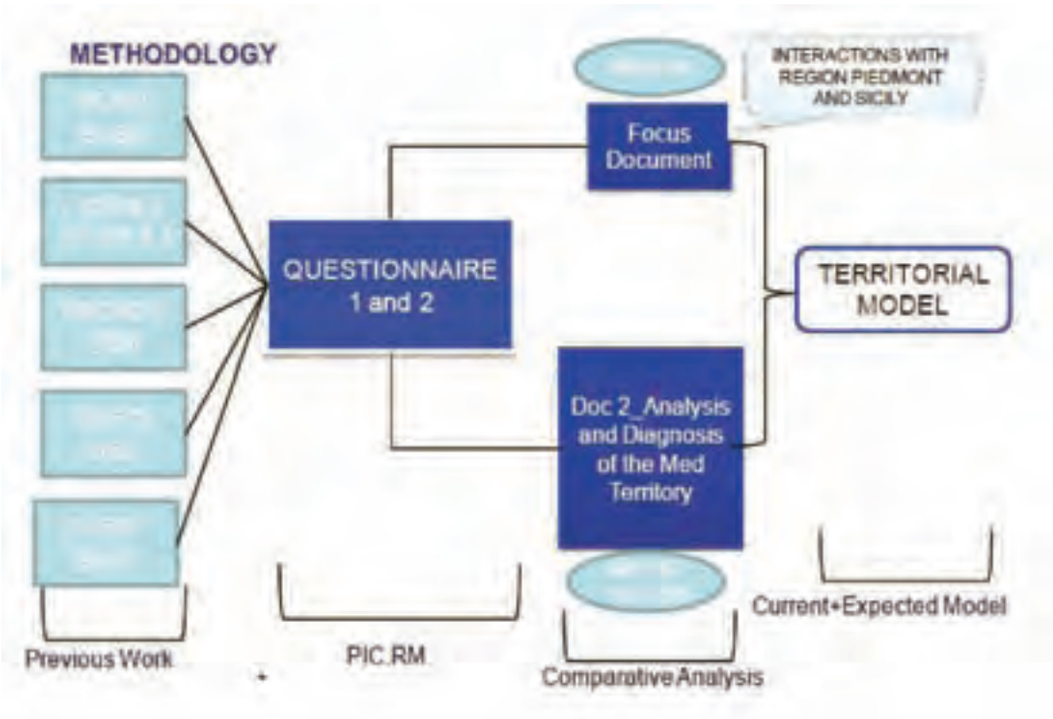
Instead, the most recent categories, which take into account the territorial dimension, the shape of the settlement and the settlement systems aggregation mode, rather than the quantitative dimension (MUA LUZ, SMESTO), seem to be more suitable for the Mediterranean observatory.

The most recent results of the regional application projects (e.g. EDORA, Urban Audit) provide a number of categories that are more suitable for the construction of a more accurate observatory in terms of the Mediterranean territorial trends. [Figure 4]

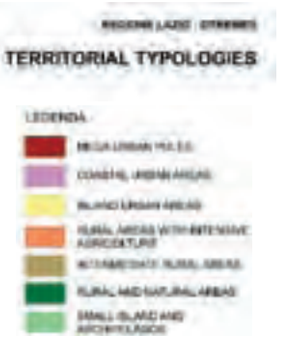
The partnership, since the first Otremed meeting, acknowledged this development of the strategic framework. Based on this, the approach adopted for the construction of the model was more focused on the problem (from which challenges arise) rather than on a generic competitive standard considered as a final target. From each pillar, therefore, the workgroup tried to focus on each specific problem. [Figure 5]

Diagram 1. The interaction between the initial stages of the Otremed project
Diagram 2. Research diagram for the characterization of the Mediterranean
Table 2. Territorial scales of reference
Figure 6. Territorial typologies of Lazio Region





Scale	*What to represent*	*Object of description*	*Minimum unit*
Macro	Global Dynamic and Trends (GDT), main aggregated data	Space Mediterranean Basin	Regions NUTS II
Micro	Effect of GDT Regional response to global trends	Regions and Territorial Typologies	Municipalities aggregated in Territorial typologies NUTS III, LAU 2



THE CONSTRUCTION OF THE MODEL: CHARACTERS, FACTORS AND INDICATORS

Lazio, Piedmont and Sicily Regions built the model in cooperation.

The Region of Lazio carried out the first territorial analysis, interpreting the original documents based on the evolution of the strategic EU scenario and identifying some basic characterization elements.

These elements were analyzed with the Region of Piedmont, which developed and processed the competitive factors arising from the characters being identified. The Region of Sicily, in turn, based on the framework of the factors they had identified, selected indicators that were used for defining the observatory. [Diagram 1,2]

In the light of the foregoing, the starting conditions are summarized as follows:

- characterization of the Mediterranean, i.e. not uniquely identifiable subject of the survey;
- extremely vast space to be analyzed;
- starting point: 11 pillars of the Lisbon Strategy, to be translated into specific concerns for the Mediterranean;
- socio-economic and political situation changed in recent years;
- new priorities clearly set by the EU: Regions 2020, Plan Bleu, MSSD, ENPI and MED programmes;
- large number of documents produced by many competent institutions in the Mediterranean area;
- impossibility to maintain a 'horizontal' behaviour in the selection of indicators, (Lisbon approach): the need to define priorities (problems and issues).
- need to focus on some relevant issues within Otremed; some strategic decisions on the observatory' structure are needed in order to define the scope of the investigation (e.g. the definition of the level of investigation NUTS II or NUTS III);
- two-track analysis: global / macro regional and local / based on one region;
- need to maintain a double vision, global and local strategy.

TERRITORIAL CRITERIA FOR BUILDING THE OBSERVATORY

The analysis of the Mediterranean space has led to the development a number of guidelines for the construction of the observatory.

Scale factor

In general, for a correct and meaningful description, the regional characterization for the MED space Observatory needs, at least for some topics, to be more detailed.

The information should be organized into categories at sub-regional level: some data can be usefully aggregated at NUTSIII level, or even at LAU 1- or 2- level for large urban areas.

The hypothesis of the observatory, therefore, prefigures two different types of macro and micro scale [Table 2]

Geographical territorial types

After discussion with the Region of Piedmont and the Region of Sicily, a 'spatial representation' by territorial categories was made. As to the Region of Lazio, territorial categories were obtained by aggregating minimal LAU2 units, i.e. municipalities, obtaining territorial types formed by groups of municipalities [Figure 6].

Qualitative factor

The use of interpretive categories, which are generally used for the ESPON space, may lead to some distortion.

In fact, it should be noted that the EU Mediterranean urban systems are very often based on clusters of small- and medium-size cities, and have strong relationships with the local territorial system, as well as a strong local identity.

The functional models should employ new categories, similar to those used in the most recent ESPON studies, such as 'Morphologic Urban Areas' (MUA), the 'Local Urban Zones' (LUZ) and the aggregations of small and medium cities (SMESTO), capable of capturing the territorial relationships between small towns and areas of influence.

In this case indicators should be both functional (e.g. isochronous) and morphological (forms of polycentric systems).

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STRATEGIC DIRECTIONS FOR THE CONSTRUCTION OF THE OBSERVATORY

The modelling work carried out by integrating a macro analysis (study of documents on the Mediterranean) and a micro analysis (questionnaires given to the regions) led to the formulation of some statements, aimed at leading the partnership to focus on factors and indicators which are relevant to the observatory. The selection of statements is based on the recurrence of topics, issues and problems identified by the partnership, but also on their discussion on the inadequate consideration to some points which are peculiar to the participating regions, and currently under-represented in the forms of representation at EU level.

STRATIFYING THE HERITAGE: CULTURE AND LANDSCAPE

Cultural heritage is the main unifying factor. It can help understand the actual conditions, trends, as well as the physical and socio-economic situation of the Mediterranean region. A deep and specific understanding of these processes is the key starting point. This leads to identifying two conceptually distinct characters:

- cultural heritage, the history of the Mediterranean as permanence of an ancient global world. This permanence is the socio-economic foundation of the places, and it determines the main characteristics which are common to each region of the Mediterranean: land use, urban form, urban and rural spatial types are strongly characterized.
- the landscape is understood as an epiphenomenon of the historical stratification of its recognized status. This is very important as it is key to the interpretation of the transformation process. Since the natural indicators of a territory reveal the degree of human presence in a region, the landscape is a resource and a tool for measuring the transformation of local economies.

ACCELERATION OF SPACE MODIFICATION: CHANGES AND LOSS OF IDENTITY

The observatory should develop specific tools to measure the regional space diachronic change and offer a dynamic overview of the transformation trends of different territories. The land use, the industrial areas, intensive and specialized agriculture should be mapped and monitored in a dynamic way.
Even infrastructure connections and the global and local isochrones for the PUSH areas should be described as a state of the art and trends / development programmes.

QUALITY ATTRIBUTES

Agglomerations must provide qualitative information, identifying a specific urbanization model: historical centre, compact city, compact industrial settlement / dispersed settlement, peripheral/suburban fringe, polycentric group, fringe, widespread sprawl, scattered sprawl.
As basic support to territorial data, and in order to have a common standard, it is recommended to adopt the classification 'Corine Land Cover'. However, forms of aggregation may be proposed.
System of minimum land use: 'Corine Land Cover', level 2, administrative boundaries (territorial typologies) LAU2 minimum unit (municipalities).
The study "Characterization of the Mediterranean" suggests some key elements (statements) as "inputs" for the establishment of the observatory. These elements are very important to describe the Mediterranean area. However, they are barely taken into account by current studies and observatories. For this reason, the current study focuses on these statements as suggestions for creating a system of representation of the specific features of the Mediterranean. **[Figure 7]**

STATEMENTS

- Common cultural heritage to enhance and highlight as a common economic basis.
- Specificity of Mediterranean urban settlements as 'mother cities' that are a part of a network of Mediterranean historic poles.
- Importance of urban and rural landscape as an expression of the stratification of cultures and economies.
- Climate as main shared element for the integration of the Mediterranean space.
- Very peculiar state of the environment and biodiversity, at serious risk because of the changes caused by the modernization of the territory.
- High level of transformation of the settlements and the territory; risk of loss of identity, especially in the southern metropolitan areas of the emerging countries.
- High level of environmental risk in ancient settlements, hydrogeology, maintenance of historical heritage.
- High level of environmental hazards (earthquakes, droughts, fires).
- High level of risk for the Mediterranean ecological activities (pollution, fishing, transport infrastructure).
- High level of risk due to the change and the increasing urbanization of coastal areas.
- Historical fragmentation of territories, cities and settlements; strong historical relationship between small and medium-sized cities and rural areas, due to a consolidated development process which is the real added value for each region. Globalization and development policies can damage this value.
- The prevalence and importance of the relationship with the sea, in many cases, must be reinterpreted in the light of globalization; need for strengthening and emphasizing the historical and cultural significance of the historical seaside cities.
- High level of unsustainable development models for tourism in coastal areas.
- Lack of awareness and fragmentation in the Mediterranean countries, and regions' backwardness in developing

Figure 7. The Mediterranean from the Spanish point of view of the sixteenth century (Real Alcazar, Sevilla)

Diagram 3. Methodological approach for the identification of a territorial model of the space MED

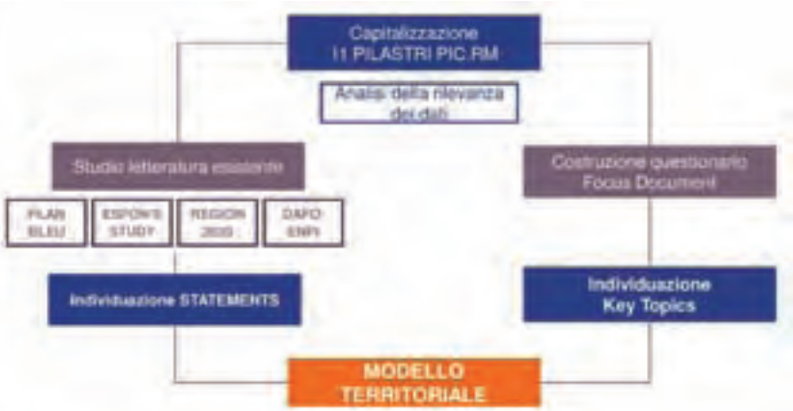


Table 3. The 11 thematic areas of "Focus Document on Regional Characterization of Mediterranean Space"

11 THEMATIC AREAS
1 REVITALIZATION OF THE URBAN SYSTEM
2 RESEARCH AND DEVELOPMENT
3 CRISIS OF RURAL
4 ACCESS TO TRANSPORT
5 ACCESS TO INFORMATION AND COMMUNICATION TECHNOLOGIES
6 SUSTAINABLE ENERGY
7 PREVENTION AND MANAGEMENT OF NATURAL RESOURCES DISASTER RELATED RISK
8 MANAGEMENT OF CULTURAL RESOURCES
9 SUSTAINABILITY OF REGIONAL ECONOMIC RESOURCES
10 GOVERNANCE
11 LANDSCAPE MANAGEMENT

A METHODOLOGY FOR A TERRITORIAL DIAGNOSIS OF THE MED SPACE

Lazio Region, with the technical support of BIC Lazio (Business Innovation Centre), was charged with the task of carrying out the activities provided for in the component "Med Space's Territorial Characterization", regarding the identification of a Mediterranean territorial model in line with previous community-based studies and with the 11 pillars of territorial competitiveness established by the PIC-RM (Project of Common Initiative for the Mediterranean Regions) in accordance with the Lisbon and Gothenburg agendas.

In addition, Region of Lazio participated as a support partner into some activities provided for by other components, such as the "Capitalisation of Previous Work" and the "Protocol for Cartographic Standardisation", of which Emilia Romagna Region and the Region of Valencia are the coordinators respectively.

The results for defining the territorial model of the Med space were shared with the representatives of Piedmont and Sicily Regions for the preparation of the territorial factors (component "Identification of Territorial Factors") and indicators (component "Identification of Territorial Indicators"). Consequently, these three components are interacting and mutually consistent.

To chart the path of research and of the work to carry out, starting from the preparation of the methodology to the drawing up and processing of results, Lazio Region asked the department DATA (Design, Tecnologia dell'Architettura, Territorio e Ambiente), of Sapienza, University of Rome[4], for scientific advice.

The aim of this component was to provide a well-reasoned and methodologically tested 'short list' of the issues that characterize the Med space. More specifically, the key topics reflecting the main issues and - we might say - also the critical aspects with which the partners identify, were selected.

The general methodological approach was the result of a continuous comparison with partners, during the steering committees[5], and of the information provided by the BOE (Boards of Experts)[6] that had periodically monitored and assessed the activities guiding the methodology for some key steps.

In general, the method shared by the partners of Lazio, Piedmont and Sicily Regions was structured as follows:

- 1. a territorial characterization, inspired by the relevant literature, starting from the ESPON documents, as a starting point for the identification of statements and the organization of a Med space model, based on some 'lowest common denominators';
- 2. an overview of the topics ideally conceived as vectors whose initial points coincide with the current state of the diagnosis, and which define a preferred scenario;
- 3. the definition of key topics, according to a multi-criteria approach, identified in the Med space, and which are key to the definition of territorial factors[7] and indicators[8];
- 4. a territorialized strategic vision represented by the observatory, i.e. an innovative tool that supports authorities in guiding and optimizing the impact of policies on their territory, thanks to a cartographic homogenization, according to the INSPIRE directives, and easy access to a web portal for a better sharing of experiences and possible strategies to be launched.

As to the work of Lazio Region, it was necessary to work in parallel on two different approaches. The first approach concerned the definition of general statements that characterize the whole Mediterranean, through the capitalization of the EU literature available. The second approach, instead, was a bottom-up one and concerned the validation and the in-depth study of some topics through a specific questionnaire. Indeed, the purpose of this knowledge instrument allowed for identifying - this is the reason why it is called Focus Document - the main trends and problems (key topics) referring to the 11 starting pillars. [Diagram 3]

Specifically, the methodology used was structured according to the following work phases:

- a) critical analysis of the indicators and factors related to the documents that had been previously processed in the framework of PIC-RM and evaluation of their relevance;
- b) verification of the availability of data;
- c) comparative analysis of the Mediterranean descriptive models in the existing literature to identify the relevant statements;
- d) drawing up and distribution among the partners of the questionnaire 'Focus Document on Regional Characterization of Mediterranean Space', to identify the key topics for the whole Mediterranean space that can highlight trends, problems and common potential;
- e) collection of questionnaires, evaluation and systematization of information provided by the 13 Regions;
- f) drawing up of a report on a territorial model that identifies the common, strategic issues for the macro Mediterranean Region.

Thematic Area	Key Topic	
	Problem	Target
DEVELOPMENT AND POPULATION DISTRIBUTION	Population decline	Sustain to young people

Table 4. Conceptual synthesis of the relationship between thematic areas, key topics and vectors

4 The technical and scientific advice, in collaboration with the technical coordinator BIC Lazio, Mr. Giovanni Pineschi, concerned the development and application of the methodology for the definition of a territorial diagnosis of the Med Space, as well as the preparation of the related contents of the report on component 3.3. MED Space's Territorial Characterization of the project Otremed -Tool for the Territorial Strategy of the MED Space, and scientific support to the other components of the project, of which the Lazio Region was not the coordinator.

5 The steering committee reported on the progress of the works, the technical aspects, the sharing of information and the definition of strategies for the next phases.

6 The meetings with the BOE have been key to the definition of a method consistent with the bottom-up approach, in particular those held in Rome on March 10th and 11th, 2011, and on October 6th, 2011.

7 Component 4.1 "Identification of Territorial Factors", organized by Piedmont Region.

8 Component 4.2 "Identification Territorial Indicators", organized by the Sicily Region.

9 The 11 thematic areas correspond to the 11 chapters of the questionnaire.

10 PIC-RM (Project d'Initiative Commune des Régions Méditerranéennes), 2005-2007, identification of 9 strategic and innovative tools aimed at promoting competitiveness and governance of the Mediterranean Regions; AMAT (Méditerranéens Ateliers d'Aménagement du Territoire), 2002-2004, promoting governance in the Mediterranean area.

11 The MED Transnational Cooperation Programme covers the Regions bordering the Mediterranean EU States (Cyprus, Greece, Slovenia, Italy, Malta, France, Spain, Portugal and the UK) as well as three pre-accession states and / or third countries in the Balkans (Croatia, Montenegro and Bosnia and Herzegovina). The overall objective of the MED Programme 2007-2013 is to foster cooperation between actors from different territories in order to transform the Mediterranean space into a competitive area at international level, ensuring growth and employment for future generations, supporting territorial cohesion and actively contributing to environmental protection in a logic of sustainable development.

12 The report provides a first analysis of the impact of four major challenges facing Europe: globalization, demographic change, climate change, and energy supply.

DEVELOPMENT OF A BOTTOM-UP APPROACH: THE DISTRIBUTION OF THE 'FOCUS DOCUMENT ON REGIONAL CHARACTERIZATION OF MEDITERRANEAN SPACE'

The questionnaire 'Focus Document on Regional Characterization of Mediterranean Space' was aimed at providing an overview of the most relevant issues in the Regions involved in the Otremed project.

The 'Focus Document' was aimed at identifying the main problems and trends affecting the 13 partners, following a bottom-up methodology to acquire information for a diagnosis of the current and future state of the Med space.

The questionnaire was structured in 11 thematic areas[9] **[Table 3]** regarding the 11 pillars resulting from the PIC-RM project (Project of Common Initiative for the Mediterranean Regions) and AMAT (Ateliers Méditerranéens d'Amenagement du Territoire)[10]. Through a comparative analysis of the 11 pillars, the MED Space Programme[11] and the Regions 2020[12] Report, the thematic areas were revised and merged, with the aim of streamlining and updating them according to the specificities of the Med space.

At a later stage, some specific topics, i.e. key topics that can effectively highlight a particular problem and / or trend in the Med Regions, were identified for each thematic area. Each Region was asked to provide an assessment on the relevance of each key topic - i.e. the identification of the problem - and to report on the presence of policies of their territories - i.e. the proposition of a target. Therefore a dynamic approach was used. This approach can be compared to a vector; through the identification of a key topic, i.e. the starting point, a problem is overcome by achieving a target. **[Table 4]**

To qualitatively quantify the relevance of the key topics, partners were asked to assign a numerical value from 0 to 3:

- 0 - not relevant;
- 1 - less relevant;
- 2 - relevant;
- 3 - very relevant.

The questionnaire provided a static yet dynamic overview of each key topic; in fact, partners were asked to summarize in a diagram both the current state and the trend regarding the implementation of policies, if any, by marking with an (X) a specific box of the diagram. **[Diagram 4]**

Following this criterion, the abscissa axis shows the state of the art as to the presence of policies. Positive responses, and, as a consequence, the presence of policies, are shown on the right hand side of the diagram; along the ordinate axis are to be identified the conditions of the status, where the top section indicates a high level of performance. The diagram is divided into boxes:

- Strength: the top partition indicates that the key topic was considered as strength and that, as a result, the Region's level of performance is good / excellent;
- Weakness: the bottom partition indicates that the key topic was considered as a weakness, and consequently the Region is faced with a negative situation or has a significant problem;
- Positive trend;
- Negative trend.

The diagram is divided into four sections; each area represents a certain degree of satisfaction related to the key topic addressed. The four sections are:

- Excellence (E1 to E4): Regions with positive values both in terms of performance and in terms of the presence of improvement policies;
- Growth (G1 to G4): Regions with positive values in terms of performance and negative values for the presence of policies;
- Decline (D1 to D4): Regions with negative values in terms of performance but positive ones for the presence of improvement policies;
- Crisis (C1 to C4): Regions with negative values both in terms of performance and for the absence of specific policies.

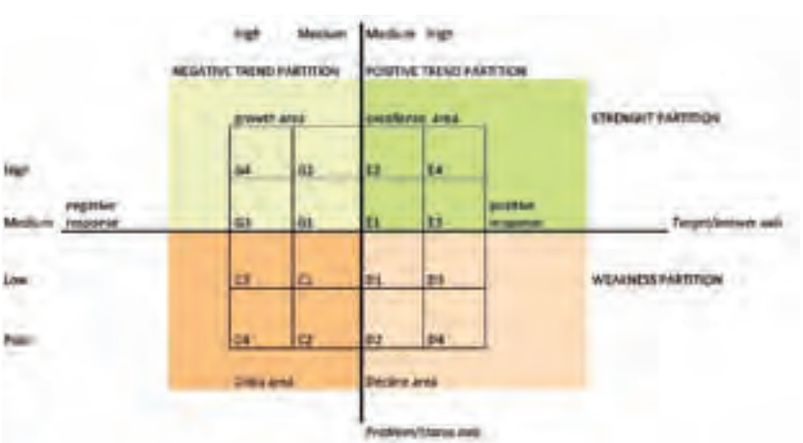
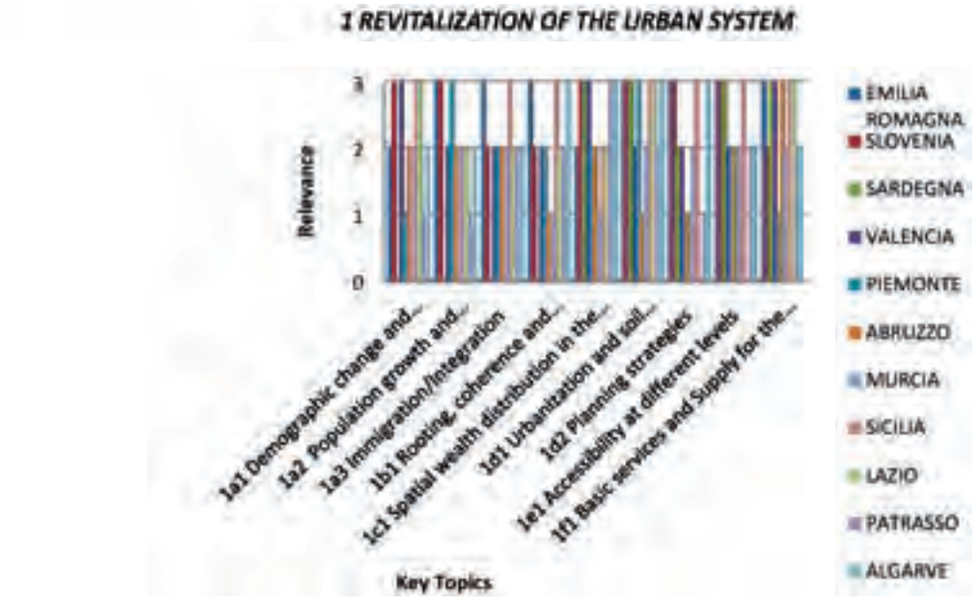


Diagram 4. Survey of the Status / Trend in "Focus Document"

	Levels				
THEMATIC AREA and KEY TOPIC	relevance	status/trend	target/foreseen	causes of no-policies	note
1 REVITALIZATION OF THE URBAN SYSTEM					
1a1 Demographic change and population distribution	2	E1	2		
1a2 Population growth and aging, critical mass	3	E3	3		
1a3 Immigration/integration	3	E1	3		
1b1 Planning, coherence and distribution between settlements and inhabitants	3	D3	1		
1c1 Spatial wealth distribution in the region	2	E4	3		
1d1 Urbanization and soil consumption degree and settlement models	3	G4	3		
1d2 Planning strategies	3	E2	3		
1e1 Accessibility at different levels	3	G2	2		
1f1 Basic services and supply for the population	3	E2	3		
2 RESEARCH AND DEVELOPMENT					
2a1 University, Higher Education Centres, Public and Private Research	3	E3	3		
2b1 Cooperation	3	E3	2		Implementation of Technological Poles.
3 CRISIS OF RURAL					
3a1 Settlement model	3	D2	2		Strategic Lines indicate by Regional Plan, but the action is delegate to Provinces
3b1 Economy of small and medium centres	2	E3	3		
4 ACCESS TO TRANSPORT					
4a1 Freight supply	3	E1	3		
4b1 Passenger transport supply	3	E3	3		
5 ACCESS TO INFORMATION AND COMMUNICATION TECHNOLOGIES					
5a1 Degree of internalization and transfer of technology	3	E4	3		
5b1 E-government diffusion	2	E4	3		
6 SUSTAINABLE ENERGY					
6a1 Energy demand and diversification	2	E3	3		
7 PREVENTION AND MANAGEMENT OF NATURAL RESOURCES DISASTER RELATED RISK					
7a1 Natural hazards and environmental restoration measures	2	E3	3		
7b1 Nature resource and economics	2	D1	2		
8 MANAGEMENT OF CULTURAL RESOURCES					
8a1 Policies for land protection	2	E2	3		
8a2 "Culture" resource and economy	2	G1	3		
9 SUSTAINABILITY OF REGIONAL ECONOMIC RESOURCES					
9a1 Employment Dynamics	3	E2	3		
9a2 Business and enterprises vitality	3	E1	3		
9a3 Structure and dimension of enterprises and economic framework	2	E1	3		
10 GOVERNANCE					
10a1 Capacity of public administration	1		2		
10a2 Services/supply provision by public administration	3	G1	3		
10b1 Efficiency of public administration	1	E1	3		
11 LANDSCAPE MANAGEMENT					
11a1 Planning and policies framework	3	E1	3		



Methodology for the systematization and evaluation of data provided by the 'Focus Documents'

The analysis and systematization of the contents of each 'Focus Document' sent by the 13 partners was carried out by means of a complex matrix [Table 5], where the answers and contents provided by the partners were processed. The lines of the matrix show the 11 thematic areas and their key topics, whereas the columns show: the Region that was analysed; the value assigned to relevance; the opinion expressed in the status / trend diagram; the presence of policies (target / answer) expressed in a numerical value from 1 to 3:

- 1 - absence of policies;
- 2 - not specified;
- 3 - presence of policies;

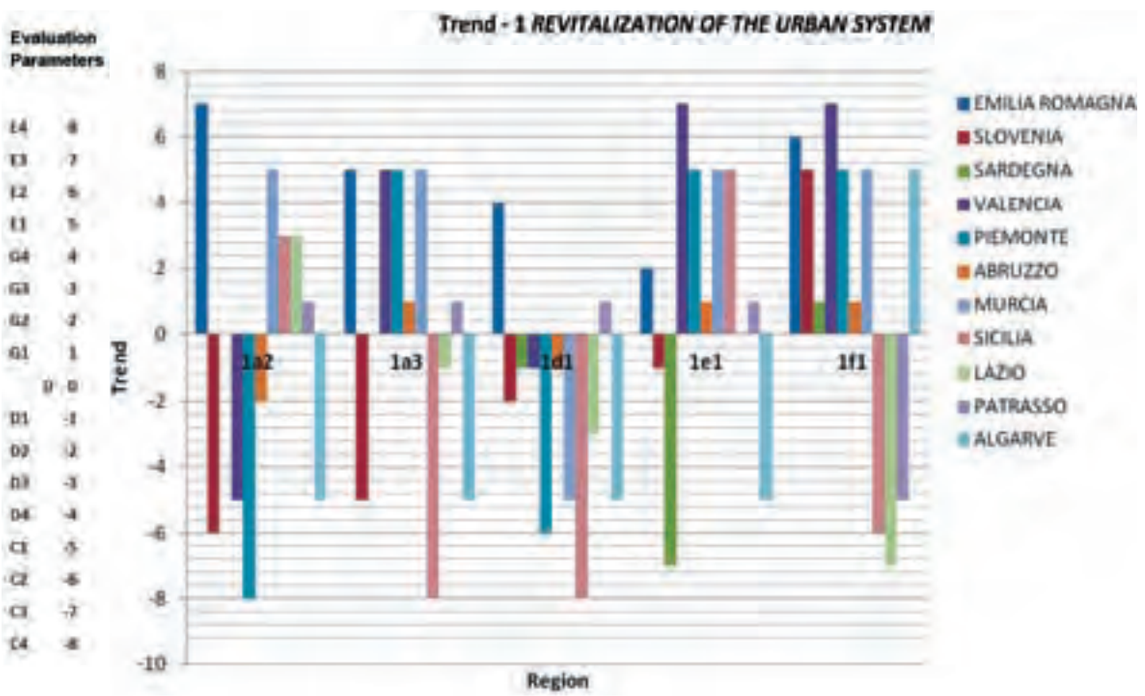
The causes of this lack of policies, and another column for notes.

The systematization phase was followed by an evaluation phase through some evaluation parameters regarding the three categories analyzed and reported by each Region: Relevance [Diagram 5] Trend [Diagram 6] and Target [Diagram 7]. Some parameters used were turned into numerical values in order to obtain unambiguous diagrams. Specifically, the parameters related to status / trend were turned into numbers as follows: the parameters from E1 to E4 correspond to the values from 8 to 5; the parameters from G1 to G4 correspond to the values from 4 to 1; the parameters from D1 to D4 correspond

Table 5. Matrix of data systematization of the Lazio Region

Diagram 5. Analysis of Relevance of the thematic area 1 Revitalization of the urban system

Diagram 6. Analysis of Trend of the thematic area 1 Revitalization of the urban system



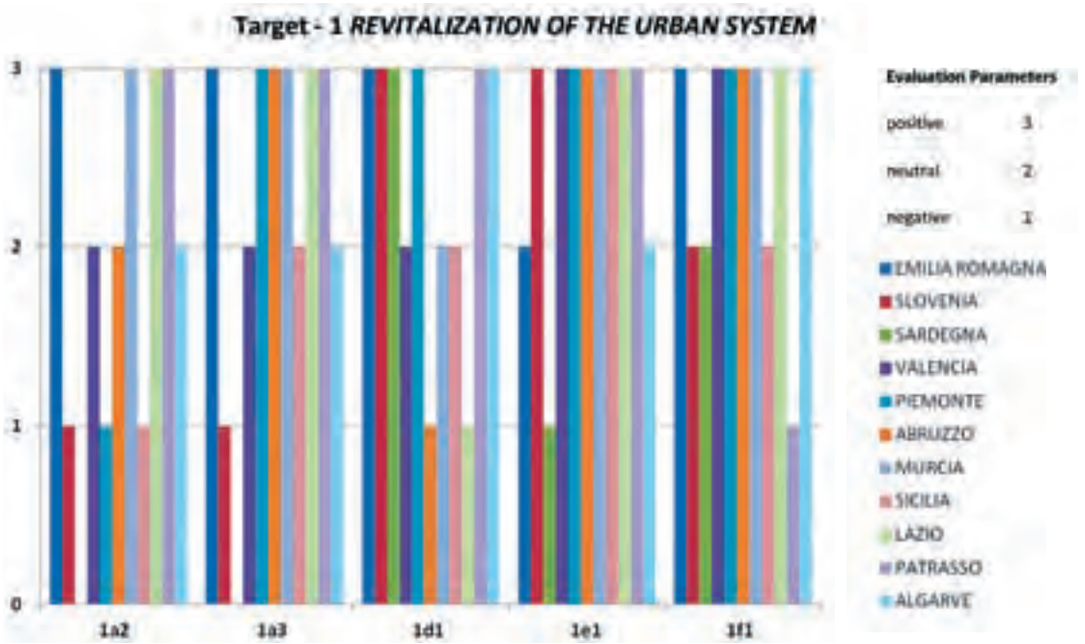


Diagram 7. Analysis of Target of the thematic area 1 Revitalization of the urban system
Diagram 8. An example of the method applied. The comparison between the Trend and Target for the thematic area 2 Research and development

to the values from -1 to -4; and the parameters from C1 to C4 correspond to the values from -5 to -8.
The comparison of the data concerning the Relevance of the topics covered and those related to Trend and Target showed that often - though not always - the value judgment combines with significant Trends, both positively and negatively, and often - but not always - with positive Targets.
This shows that that most times, and consistently so, the situations of decline-crisis / growth-excellence Regions have experienced are considered relevant issues by them. However, in some cases the perception of the Relevance of a topic or issue does not seem to be directly linked to the data reported by each Region, thus representing an 'abstract evaluation' of what is or should be relevant.
Below is an example of comparison between Trend and Target for thematic area 2 'Research and development' to explain the evaluation method applied. [Diagram 8]
To identify the thematic areas and the key topics a matrix comprising the four evaluation parameters regarding Relevance (from very relevant to not relevant) reported by each Region [Table 6] was developed. Subsequently, the thematic areas and the related key topics considered to be very relevant (numeric value 3) or relevant (numeric value 2) by the majority of the partners were selected.
The thematic areas, with some of the corresponding key topics, are nine:

- 1 - Revitalization of the urban system;
- 2 - Research and development;
- 3 - Rural crisis;
- 4 - Accessibility and transport;
- 5 - Access to information and communication technologies;
- 6 - Cultural resource management;
- 7 - Regional economic sustainability of resources;
- 8 - Governance;
- 9 - Landscape management;

as reported in Table 7.
Other key topics not deemed relevant, as shown by the evaluation process of the questionnaires, were added to the above mentioned nine thematic areas. These extra key topics are: the capacity of the public administration; energy demand and diversification; natural disasters and environmental recovery measures. Although not relevant according to the questionnaires, these key topics were deemed important in the current European debate, in an exchange with the other partners and also for identifying the territorial indicators. [Table 8]

Thanks to the parallel work that has led to the identification of both the statements and the relevant key topics, it was possible to outline a territorial model of the Med space which, in addition to the diversity and complexity of individual Regions, also takes into account the peculiarities that make it an homogeneous 'entity' which can be seen as a unitary system.

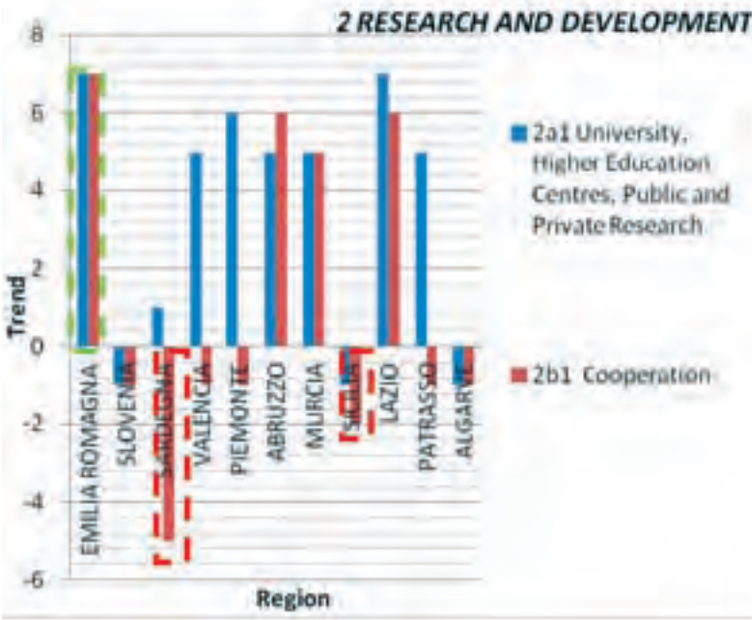
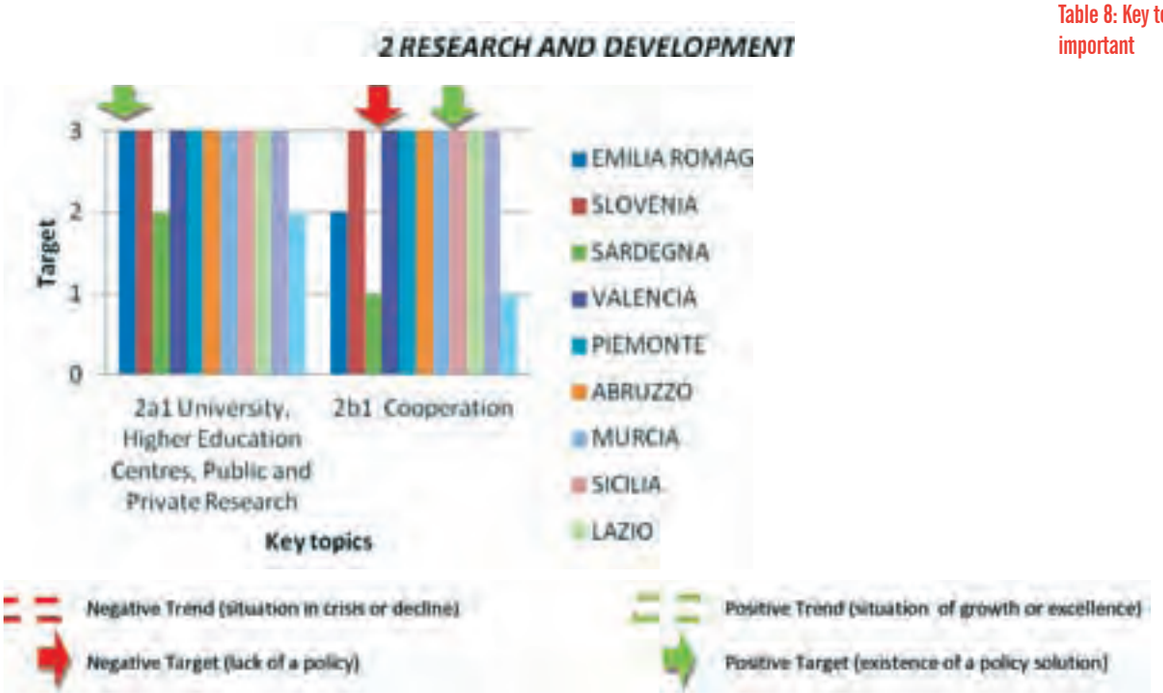


Table 6. General matrix for the identification of relevant Key Topic

Table 7. Thematic areas and key topics relevant results

Table 8: Key topics excluded but are considered important



Territorial factors and indicators

42

MED space territorial factors

In the current globalised economy, the regions forming the MED space tend to construct their competitive advantage on the basis of some place-specific sets of local assets. Consistently with the geographical variety (socio-economic, cultural and physical) of MED regions, these assets include a highly varied group of territorial factors and development conditions.

Nevertheless, as far as the greatest development challenges affecting the MED space are considered, the competitiveness of Mediterranean regions is usually reported to a quite reduced set of "keywords" or competitive territorial factors.

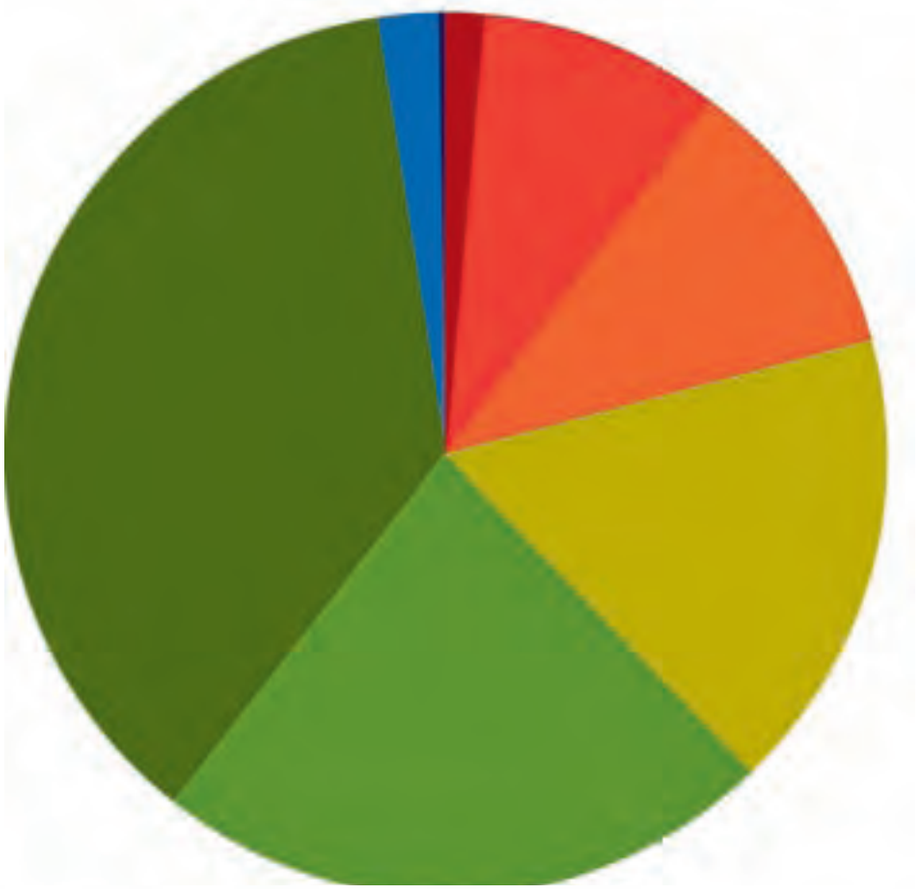
In the context of the OTREMED project, the aim of the work carried out by Regione Piemonte and IRES Piemonte has been to provide a territorialised list of such competitive factors reflecting both the specificity of the Mediterranean development model (based on the findings described by Region Lazio and BIC Lazio in the previous chapter) and the uniqueness of the priorities, problems and goals of every territory forming the MED space.

More specifically, the competitive factors reflect the MED regions' representation of the main development issues and factors in the MED space. In fact, they have been identified on the basis of a two-step process including:

- a survey among OTREMED project partners. Via the distribution of a questionnaire, representatives of the OTREMED Regions (13 regions) have been asked to indicate, for every NUTS 3 region in their territory, the share of the land area corresponding to some emerging territorial typologies (MEGA urban poles, Coastal urban areas, Inland urban areas, Rural areas with intensive agriculture, Intermediary rural areas, Rural and natural areas, Small islands and archipelagos). Then, according to their regional experience, they have been asked to: a) select, among the development challenges affecting the Mediterranean – which have been described in the report of Lazio partners –, the most urgent challenges; b) indicate the territorial typologies where these priorities were most evident; c) detect a reduced list of the territorial factors and related policies that enable the regional system to cope with the previously selected development challenges and territories;
- a validation process with representatives of MED Regions that were not partners of the OTREMED project. The preliminary results of the survey among OTREMED partners have been sent to representatives of all the other MED Regions, asking for their feed-backs, comments, advices, etc. 19 regions participated to the validation process.

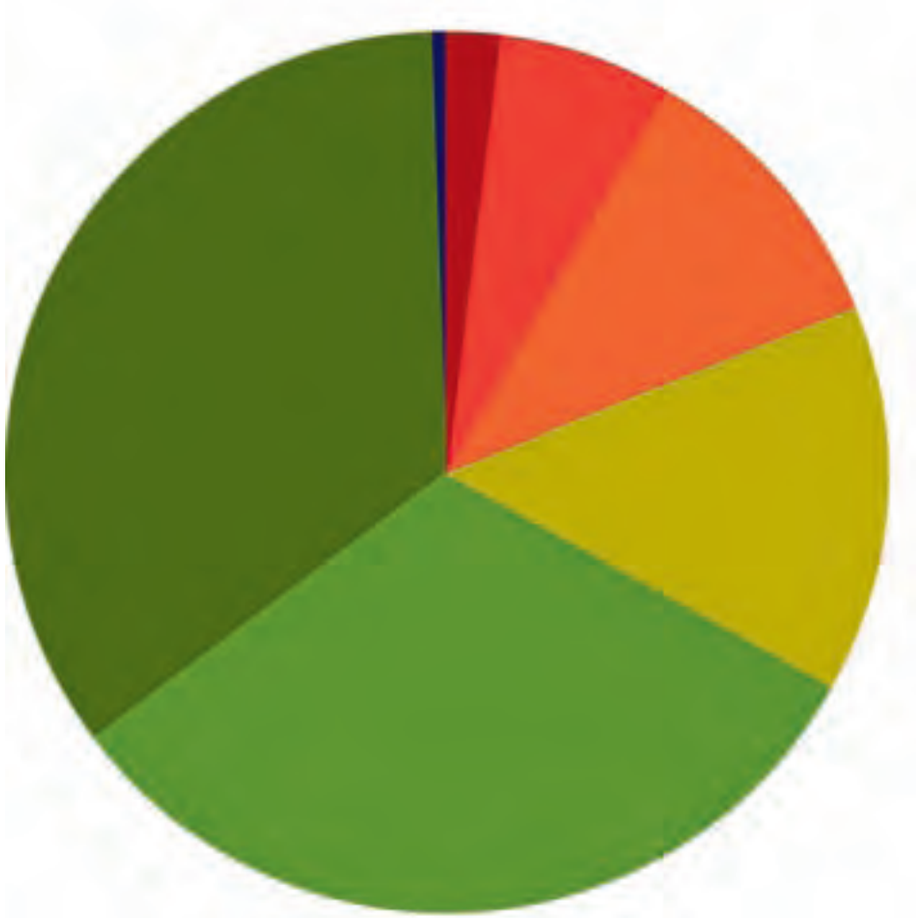
As a result, the survey and the validation procedure led to the identification of a MED-specific competitive model, whose essence is characterised as follows:

- the MED space (13 OTREMED regions + 19 non-OTREMED regions) presents a highly diversified territorial structure that overlaps poorly with the regional administrative partition. Most of the MED land area is constituted by rural and natural areas (36.8%). A relevant share of these consists of intermediary rural areas (22.9%). Rural areas with intensive agriculture occupy the 16.8% of the total surface, while urban areas occupy the 21.1%: this percentage is composed by 10.7% of inland areas, 8.8% of coastal areas, and 1.6% of MEGA poles. Finally, small islands and archipelagos account for 2.2%. The residual 0.2% consists of a highly mixed system of territorial typologies;
- nevertheless, any attempt to report the MED space to a well-defined sample of geographical regions, characterised by homogeneous territorial features (mountain, hill and plain areas; internal or coastal) and prevailing functions (urban or rural; central or peripheral) clashes with the dense presence of human activities that characterises the largest portion of the MED space, leading to a high degree of functional overlapping. Indeed, in the MED regions residential, agricultural, industrial, and service activities often coexist in the same places;
- a reason for the great territorial variety of the MED space relies on the history and geography of its regions. In the MED space, a vast heritage of tangible and intangible assets, which have been defined by an historic layering of values and cultures, and an accumulation of traditions and social, cultural and economic experiences, is recognized as such in its diversity and it is used to feed networks of relationships at various geographical scales (from the local to the global). In this sense, MED space uses traditionally embedded assets (such as cultural heritage, landscape, traditional industries and know-how) to construct its competitive advantage in a multi-scalar and trans-scalar way;
- yet, the development model expressed by the MED space is also contradictory in a certain sense. More specifically, the factors that have been mentioned as MED strengths by some Regions have been mentioned as weaknesses by other ones. For instance, this is the case of transport infrastructures and services, and firm-university relationships;
- moreover, in comparison with other European macro-regions, the MED space is highly dependent on external fluxes of energy, resources, goods and competences, and those fluxes are often characterised by seasonal trends. Particularly, this is the case of summer and winter tourism, that generates congestion and overcrowding effects above all in coastal urban areas;
- indeed, coastal areas emerge as key strategic territories pushing MED space competitiveness. On the one hand, almost all the surveyed regions (both OTREMED and non-OTREMED), have in fact showed to be aware of the strategic role of coastal areas with respect to several development challenges (revitalisation of the urban system, access to transport, research and develop-



Med space territorial typologies

- Other
- Small islands and archipelagos
- Rural and natural areas
- Intermediary rural areas
- Rural areas with intensive agriculture
- Inland urban areas
- Coastal urban areas
- MEGA urban poles



OTREMED regions

- Other
- Small islands and archipelagos
- Rural and natural areas
- Intermediary rural areas
- Rural areas with intensive agriculture
- Inland urban areas
- Coastal urban areas
- MEGA urban poles

Vercelli province. Typical rice farms
(© Regione Piemonte)

ment), functions (economic, residential, environmental) and scales of intervention (urban, regional and Mediterranean). On the other hand, the scarce presence of small islands and archipelagos in the analysed regional contexts (in OTREMED particularly, where they account for only the 0,2% of the overall land area) has determined a certain underestimation of the centrality of these territories.

In the table that follows the competitive territorial factors in the MED space (third column in the table) are represented by a reduced set of synthetic key words and organised according to both the key development themes/challenges (first column) they concur to cope with, and a list of related sub-themes/challenges or territorial dynamics (second column), which have been detected as the most relevant according to the conclusive results of the MED space territorial characterisation. Finally, the forth column in the table shows the territorial typologies more frequently associated to each competitive territorial factor (i.e. territories that were mentioned by at least five Regions).

Summarising, the analysis conducted on the competitive territorial factors of the MED space has led to the comprehension that MED Regions still suffer from a dependence on a dominant innovation-related development model that characterises the development of Western and Northern European regions more than than Southern and Eastern ones. In particular, consistently with the Lisbon strategy, MED regions have attributed in their agendas great centrality to technological innovation assets such as the presence, above all in urban centres, of universities and higher education institutions, research and technology centres, science parks, R&D investments, cooperative partnerships, and advanced services.

Nevertheless, hints of the progressive drifting away of MED regions' agendas from the dominant EC development model have also appeared in terms of:

- the recognition of the importance of both planning and monitoring tools and governance processes in any type of territories. In particular, great centrality is attributed to the planning of efficient multimodal transport systems in urbanised territories;
- the emphasis posed on the preservation and valorisation of local resources such as the human, technical and cultural capital, the locally rooted technical know-how, and the urban and natural landscape;
- the centrality attributed (mainly in urban contexts) to individuals' needs and issues such as the access to services and job market, and their territorial embedding into the local economic, social and territorial processes;
- the increasing importance posed to the cultural and creative economies, hybridising traditional know-how and innovative technologies and languages, as well as to the green economy paradigm.

To say it differently, coherently with the next place-based turn in the EC cohesion policies, the MED space seems to move from the cliché of the promotion of the competitiveness per se to the pursuing of a territorially embedded definition of competitiveness.

The MED space is working to be the place where diversities can cohabit and come to a cohesive and competitive synthesis in the name of the fruition, construction and valorisation of a common (although diversified) heritage of Mediterranean cultures, activities, and landscapes.

In other words, the essence of the MED model stays in the provision of the conditions enabling a territorially diversified set of models/processes of settlement and economic development. The MED model is a multi-model, whose success does not rely on a single receipt, but on the collaborative and creative hybridisation of different existing recipes.

This competitive model has been also approved by the majority of the Regions participating to the validation process. In particular, they have underwritten the final conclusions, whereas they expressed some doubts on the territorial characterisation resulting from the survey among the OTREMED Regions. As it was predictable: the more diverse the regional territorial conditions were (in comparison with those of the majority of OTREMED regions), the greater the proposed modifications.

Torino. Borders of the city (© Regione Piemonte)

Key Development Axes / challenges	Sole Scenario - challenges or territorial dynamics in the MED space	Competitive territorial factors in the MED space	Territories to which the factor is mostly referred
1. Revitalization of the urban system	Population growth, aging population, and critical mass in active population Immigration/integration Urbanization, soil consumption degree, and settlement models Accessibility at different levels Basic services and supply for the population	urbanization and soil consumption trends	coastal urban areas inland urban areas
		demographic trends	rural and natural areas inland urban areas
		planning tools/practices	rural and natural areas intermediary rural areas coastal urban areas rural areas with intensive agriculture
		integrated transport systems	inland urban areas coastal urban areas MEGA urban poles
		services supply	rural and natural areas
2. Research and development	University, Higher Education Centers, Public and Private Research Institutions Cooperation	integrated research systems	coastal urban areas inland urban areas MEGA urban poles
		public-private partnerships	
		public and private investments	
		human capital	
3. Crisis of rural	Economy of small and medium centres	planning tools/practices	rural and natural areas intermediary rural areas coastal urban areas rural areas with intensive agriculture
		natural capital	rural and natural areas intermediary rural areas rural areas with intensive agriculture
		innovative agriculture	rural areas with intensive agriculture
4. Access to transport	Freight supply	integrated transport systems	inland urban areas coastal urban areas MEGA urban poles
		multimodality	
5. Access to information and communication technologies	Degree of internationalization and transfer of technology E-government diffusion	high-speed connections	coastal urban areas MEGA urban poles
		technological innovation	coastal urban areas
6. Sustainable energy	Energy demand and diversification	green economy	MEGA urban poles intermediary rural areas
		renewable energy sources	coastal urban areas inland urban areas
		energy diversification	intermediary rural areas
7. Disaster related risk prevention and management of natural resources	Natural hazards and environmental restoration measures	planning tools/practices	rural and natural areas rural and natural areas intermediary rural areas coastal urban areas rural areas with intensive agriculture
		monitoring	
8. Management of cultural resources	Policies for land protection	planning tools/practices	rural and natural areas coastal urban areas rural areas with intensive agriculture
	"Culture" resource and economy	cultural capital	inland urban areas MEGA urban poles
9. Sustainability of regional economic resources	Employment Dynamics Structure and dimension of enterprises and economic framework	technical capital	inland urban areas
		technological innovation	inland urban areas intermediary rural areas
		green economy	MEGA urban poles intermediary rural areas
		renewable energy sources	inland urban areas
		human capital	MEGA urban poles
		job market	inland urban areas
		public-private partnership	coastal urban areas
10. Governance	Services supply provision by public administration Efficiency of public administration	public-public partnership	rural and natural areas
		social capital	coastal urban areas inland urban areas
11. Landscape management	Planning and policies framework	planning tools/practices	rural and natural areas intermediary rural areas coastal urban areas rural areas with intensive agriculture
		natural capital	rural and natural areas intermediary rural areas rural areas with intensive agriculture
		landscape capital	rural and natural areas intermediary rural areas rural areas with intensive agriculture
		urbanization and soil consumption trends	coastal urban areas inland urban areas intermediary rural areas


strenghts
planning tools and practices
weaknesses
renewable energy sources
public-private partnerships
technical capital
high speed connections
human capital
landscape capital
services supply
natural capital
job market
multimodality
cultural capital
social capital
public-public partnerships
innovative agriculture
integrated transport systems
urbanisation and soil consumption trends
green economy
energy diversification
technological innovation
demographic trends
integrated research systems
opportunities
monitoring
threats

A SWOT ANALYSIS

The scheme presented in the next page summarises the results of the analysis conducted among OTREMED partners and organises the territorial factors according to the role that each one of them plays in the construction of the competitive advantage of the area.

Of course, the scheme represents a general portrait of the MED space, mainly based on the characterisation of the area made (see previous chapter), on an overview of main statistical data and on the answers given to the questionnaires for the identification of the territorial factors. Each MED territory could make its own SWOT analysis, placing differently the factors on the scheme.

The goal of this synthesis is not to draw an exhaustive picture of the MED space, rather to offer a general reference model for the competitive placement of each region or territory.

Some very general elements emerge from the picture of the MED space taken through the SWOT analysis on territorial factors.

1. MED space possesses a strong territorial capital, but it is often underexploited and endangered by emerging phenomena (sprawl, demographic dynamics, few investments in R&D etc.).

The mere existence of a rich territorial capital is not a guarantee for the competitive capacity of a region. The key challenge that MED space regions have to face seems to be the definition and the pursuit of innovative and sustainable policies in the exploitation of their territorial capital, aiming both at protecting and reproducing it. The two main obstacles in this direction seem to be: a) the scarcity of long-term development visions, and the prevailing of short-termed policies/practices; b) the scarce awareness about territorial capital value, in cultural as well as economic terms. Without such an awareness development risks to be built on fragile basis, and most of all to be highly dependant from the outside.

2. MED space main weaknesses seem to be linked to its governance system (in particular to its capacity of managing the effects produced by interactions among different phenomena and different scales), and to a insufficient/non-homogeneous infrastructures system.

Regardless of the specific institutional assets, almost all of OTREMED partners described existing governance systems as weaknesses, if not obstacles for policies efficacy. The main problems in this context are two: a) a scarce integration among different administrative levels, both vertically (among administrations at different territorial scales) and horizontally (among different branches/sectors of the same administrations); b) a scarce integration among various specific policies, each one coping with a different issue (environment, energy, industry, tourism etc.). The way out for such a situation seems to be the capacity of progressively shifting from a competence-centred approach (the definition of a problem and its solutions is a task of specific branches of public administrations) to a problem-centred one (starting from the definition of a problem the proper administrative resources are mobilised, not depending on the already institutionalised existing task divisions).

3.MED space main opportunities seem to rely on the capacity of elaborating new ways for valorising the existing resources and capabilities, in a sort of “strategic bricolage”, and of investing heavily on innovation (financially, but also culturally and socially).

One of the most relevant challenges that MED regions have to face is the combination of existing resources, above all according to the following issues:

- the capacity of combining in a creative and effective way public and private research systems, so as to increase investment capacity of single companies through networks that can maximize the circulation of ideas, resources and professional skills;
- the necessity of supporting the creation of industrial clusters and their internationalisation process, once again with public-private synergies;
- the need for innovation also in more traditional fields such as agriculture and handicraft, that have high quality standards but sometimes have a scarce capacity of developing new production/marketing models;
- the need for strong investments in training, so as to valorise existing human and technical capital an to give them the capacity of facing globalisation.

4.MED space two major threats are linked with the demographic dynamics (especially if compared with those of the southern part of the MED basin) and with the perpetuation of a soil-consuming urbanisation model that endangers the territorial capital and the efficiency of infrastructures and services.

Demographic phenomena such as ageing population, low fertility rates, peripherical territories depopulation are quite common in Europe, but in certain MED territories are particularly intense. Their impact can be quite dramatic, above all in terms of welfare system costs, innovation capacity, richness production and so on. Public policies facing these phenomena should first of all have a long-term horizon, and probably their main focus should be on the welfare system (for example strengthening services networks), taxation (for example subsidizing couples with children) and the living conditions in marginal areas.

The high rates of soil consumption that characterise large portions of the MED space are the result of policies that have underestimated not only the direct costs of such settlement models (on landscape, natural capital, cultural heritage etc.), but also the indirect ones (on mobility, on services and so on). Contrasting soil consumption requires interventions on three levels at the same time:

- the normative one, so as to protect the existing territorial capital;
- the economic one, in order to increase the advantages of less soil-consuming urbanisation practices (for example through incentives, taxes exemptions and so on);
- finally, the cultural one, making all concerned stakeholders (public and private) and citizens aware of the real costs of soil consumption.

5.The emphasis on planning and monitoring tools seems to be the expression of the need for: 1) an in-depth and continuous analysis of ongoing dynamics; 2) a strategic and integrated approach towards development; 3) a stronger coordination among policies (both vertically and horizontally).

MED regions are usually managed through a wide range of planning and monitoring tools. Nevertheless, the analysis made in the context of OTREMED raised many questions about their efficacy and capability of addressing effectively ongoing territorial or economic dynamics. The existing tools are generally seen as useful, even if their efficacy is endangered by three main kind of problems:

- a lack of knowledge, since many sectorial tools focus their attention on specific issues, underestimating the connections with other tools or policies;
- a lack of vision, since many tools do not have the capacity of addressing territorial dynamics towards long-term objectives, and also when they do so they are not designed for absorbing the changes of the context they are governing;
- a scarce capacity of positively interact with other programming, planning and monitoring tools, so that contradictions, normative conflicts and other kinds of non-complementarities are quite common.

Nevertheless, planning and monitoring tools are still a crucial mean for public authorities' action. Probably they would have to be more flexible and "self-adaptable" to ever-changing social, economic and territorial contexts, but at the same time they have to maintain their capacity of designing shared long-term development perspectives.

Langhe hills (© Regione Piemonte)

Indicators

Indicators have been generally used within the framework of operative issues related to the knowledge of natural environment and living condition as well as for the premises and implementation of programming, planning, design guidelines. Indicators constitute the basis of any methodology of evaluation and assessment, both ex ante, ex post and in itinere. In a certain sense, we can argue that with correct and available indicator, it is possible to well know the target-context and the best sustainable actions.
The above short examination highlights that lists of indicators which have been collected in set, database, pillars, key topic (etc.) can show several differences as regards: nature, sources, bibliographies, etc. (according to the targeted objective) and scale of reference:

1. generic context analysis of the status of an environment/territory/place/point;
2. scientific analysis of the status of an etpp;
3. to support a project;
4. to support a plan;
5. to support programming;
6. monitoring the status of an etpp trend;
7. monitoring the status of atlp undergoing concrete anthropic action;
8. assessment of a plan/program/project respect to a status of atpl.

Indicator: 2.2 Changes in GDP of Public Institutions spending on Research and Development (expressed as percentage of GDP)

Key topic – challenge: 7.2.2 Research and development
Pillar: 3.2 Research and development hot spots
Indicator description and other useful information: Expenditure on research and development (R&D) can be considered as an investment in knowledge that translates into new technologies as well as more efficient ways of using existing resources of physical and human capital

Indicator: 2.3 Changes of private/public enterprises in GDP spending on Research and Development (expressed relative to gross domestic product (GDP)

Key topic – challenge: 7.2.2 Research and development
Pillar: 3.2 Research and development hot spots
Indicator description and other useful information: Data on spending for research and development within the European Union (EU), according as the supply and the source of the funds are obtained through surveys that are regularly conducted at national level covering the R & D entities that engage in public and private sector. The comparison between data from different years shows the variation in expenditure on R & D.

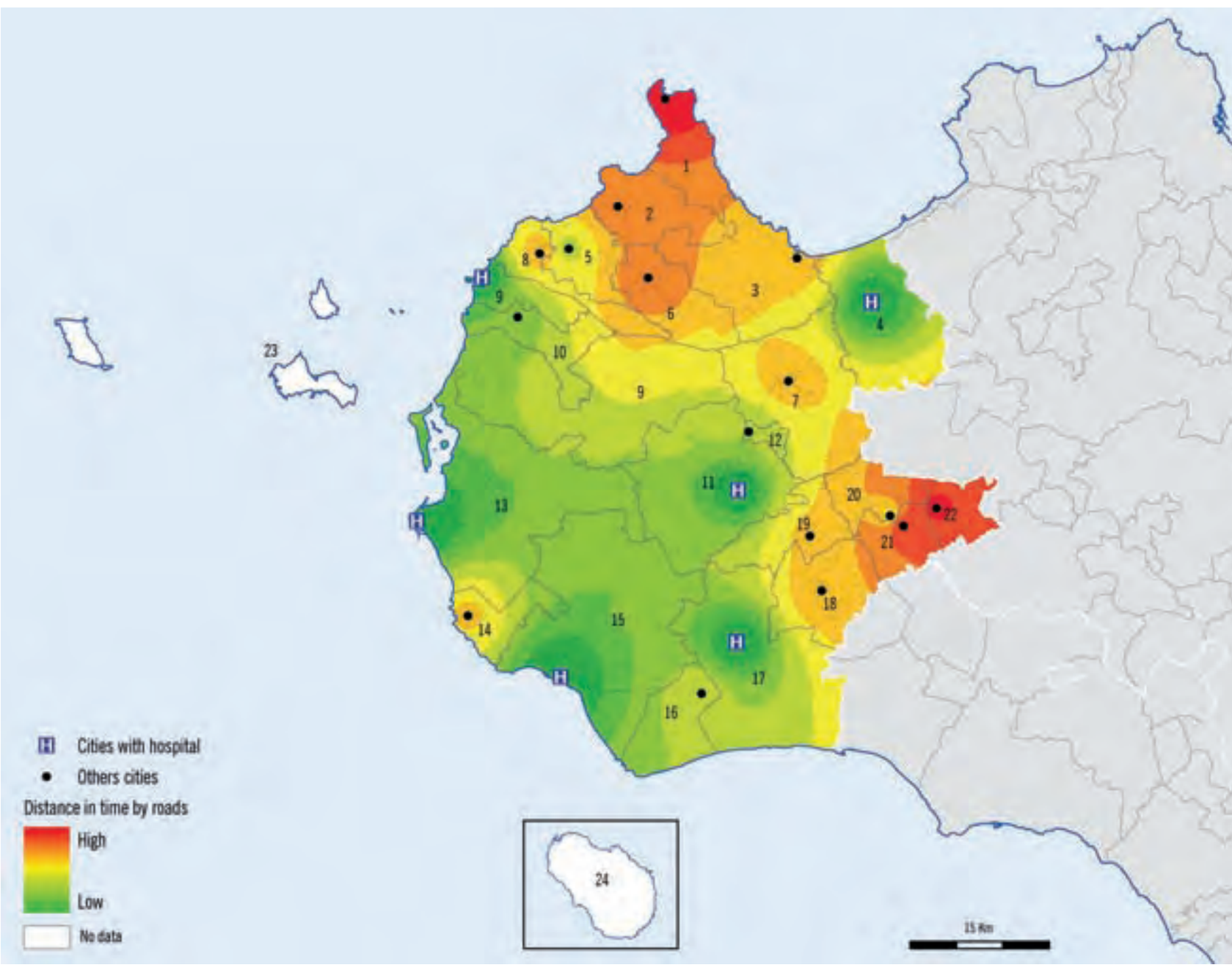
Indicator: 2.4 Changes in number of researchers / 1000 employees

Key topic – challenge: 7.2.2 Research and development
Pillar: 3.2 Research and development hot spots
Indicator description and other useful information: This indicator shows the percentage change of people employed in R&D on 1000 employed, to show how a region is able to produce research and innovation so as to reduce dependence on other territories.

Indicator: 3.1 Variation of the relationship between agriculture employees and residents in agricultural areas

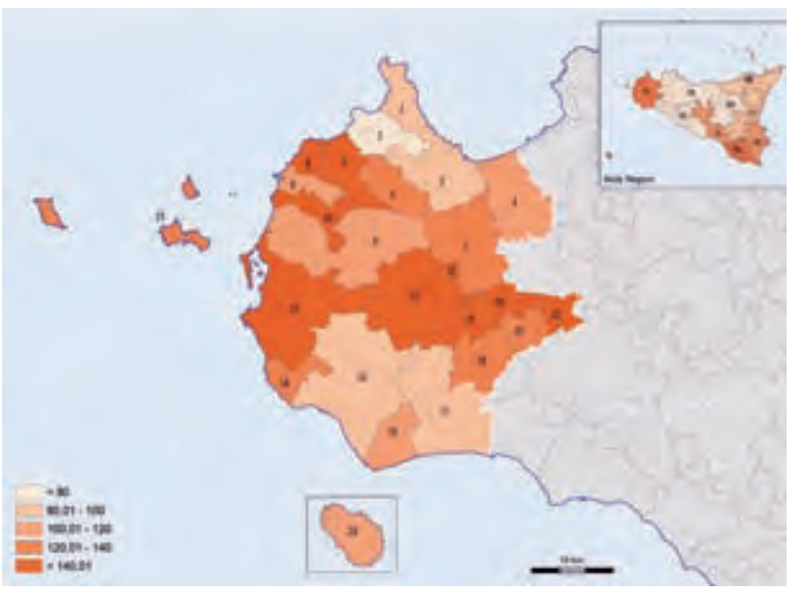
Key topic – challenge: 7.2.3 Crisis of rural
Pillar: 3.3 Urban-rural relationship
Indicator description and other useful information: This indicator shows the evolution of the rural world, highlighting the change of the ratio of the labor force in agriculture in those areas classified as predominantly rural regions and residents of rural areas.

Distance in time to basic facilities



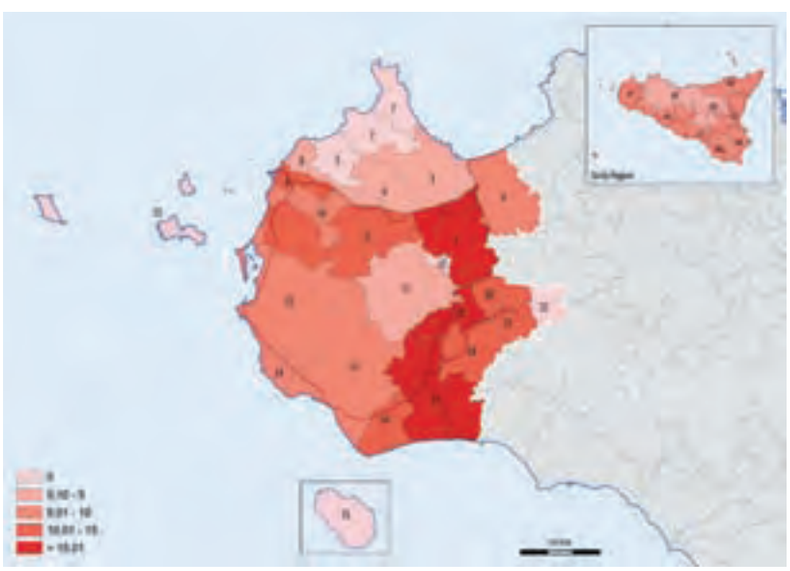
Number of people employed in Research and Development

Ratio of agricultural area used for organic production and total UAA
Density of transport infrastructures - road network
Density of transport infrastructures - rail network



Indicator: 3.2 Changes in rural land

Key topic – challenge: 7.2.3 Crisis of rural
Pillar: 3.3 Urban-rural relationship
Indicator description and other useful information: Comparing the area values of the corine land cover levels 2 (Agriculture areas) with 3.1 (Forest) in different years is possible to know if the surfaces vary, and how fast. This indicator helps to measure the loss of rural areas.



Indicator: 3.3 Ratio of agricultural area used for organic production and total UAA

Key topic – challenge: 7.2.3 Crisis of rural
Pillar: 3.3 Urban-rural relationship
Indicator description and other useful information: This indicator highlights innovation factors in local and typical production that is connected to preservation of biodiversity. Eurostat collects data on organic farming from national Certification and Inspection bodies. This data collection can differ from the FSS data on organic farming due to the different statistical unit (for organic statistics the unit is the certified agricultural holding) and to the data collection methodology (organic farming data is taken from administrative registers).

Indicator: 4.1 Projects' number on multimodal and/or integrated platform strategies planned or realized

Key topic – challenge: 7.2.4 Access to transport
Pillar: 3.4 Access to transport
Indicator description and other useful information: Number of project, plan, policies for development of multimodal and/or integrated transport solutions co-funded by ERDF. It is adivisable that for all regions, exist policies for development of multimodal and/or integrated transport solutions.

Indicator: 4.2 Ingoing/outgoing passengers for each transport mean

Key topic – challenge: 7.2.4 Access to transport
Pillar: 3.4 Access to transport
Indicator description and other useful information:
number of ingoing/outgoing passengers travelling by air (numero di passeggeri che arrivano/partono a mezzo di aereo);

number of ingoing/outgoing passengers travelling by ship (numero di passeggeri che arrivano/partono a mezzo di nave);
number of ingoing/outgoing passengers travelling by train (numero di passeggeri che arrivano/partono a mezzo di treno).

Indicator: 4.3 Density of transport infrastructures

Key topic – challenge: 7.2.4 Access to transport
Pillar: 3.4 Access to transport
Indicator description and other useful information:
length of extra-urban road network referred to 100 sq km of territory;
length of extra-urban rail network referred to 100 sq km of territory.

Indicator: 4.4 External access to territories

Key topic – challenge: 7.2.4 Access to transport
Pillar: 3.4 Access to transport
Indicator description and other useful information:
Number of direct connection by air;
Number of direct connections by ship;

Indicator: 5.1 Variation in Households with broadband access (isoc_r_broad_h) (ref. Eurostat).

Key topic – challenge: 7.2.5 Access to communication and information technologies
Pillar: 3.5 Access to communication and information technologies
Indicator description and other useful information:

Indicator: 5.2 variation of percentage of companies using wide band fixed connection

Key topic – challenge: 7.2.5 Access to communication and information technologies
Pillar: 3.5 Access to communication and information technologies
Indicator description and other useful information: The indicator measures the degree of adoption of Internet high-speed connections by companies.

Indicator: 6.1 Changes in energy intensity (TPE / € 1,000 GDP) for the economy

Key topic – challenge: 7.2.6 Sustainable energy
Pillar: 3.6 Sustainable energy
Indicator description and other useful information:
Energy intensity is measured as the ratio between gross inland consumption of energy and GDP; this indicator is a key indicator for measuring progress under the Europe 2020 strategy for smart, sustainable and inclusive growth.

Indicator: 6.2 Changes in the percentage of energy produced by renewable energy sources in primary energy consumption

Key topic – challenge: 7.2.6 Sustainable energy
Pillar: 3.6 Sustainable energy
Indicator description and other useful information: Primary production of energy is any extraction of energy products in a useable form from natural sources. This occurs either when natural sources are exploited (for example, in coal mines, crude oil fields, hydro power plants) or in the fabrication of biofuels. Transforming energy from one form into another, such as electricity or heat generation in thermal power plants (where primary energy sources are burned), or coke production in coke ovens, is not primary production (source Eurostat).

Indicator: 7.1 Percentage of townships with emergency plans for the prevention of natural disaster risk

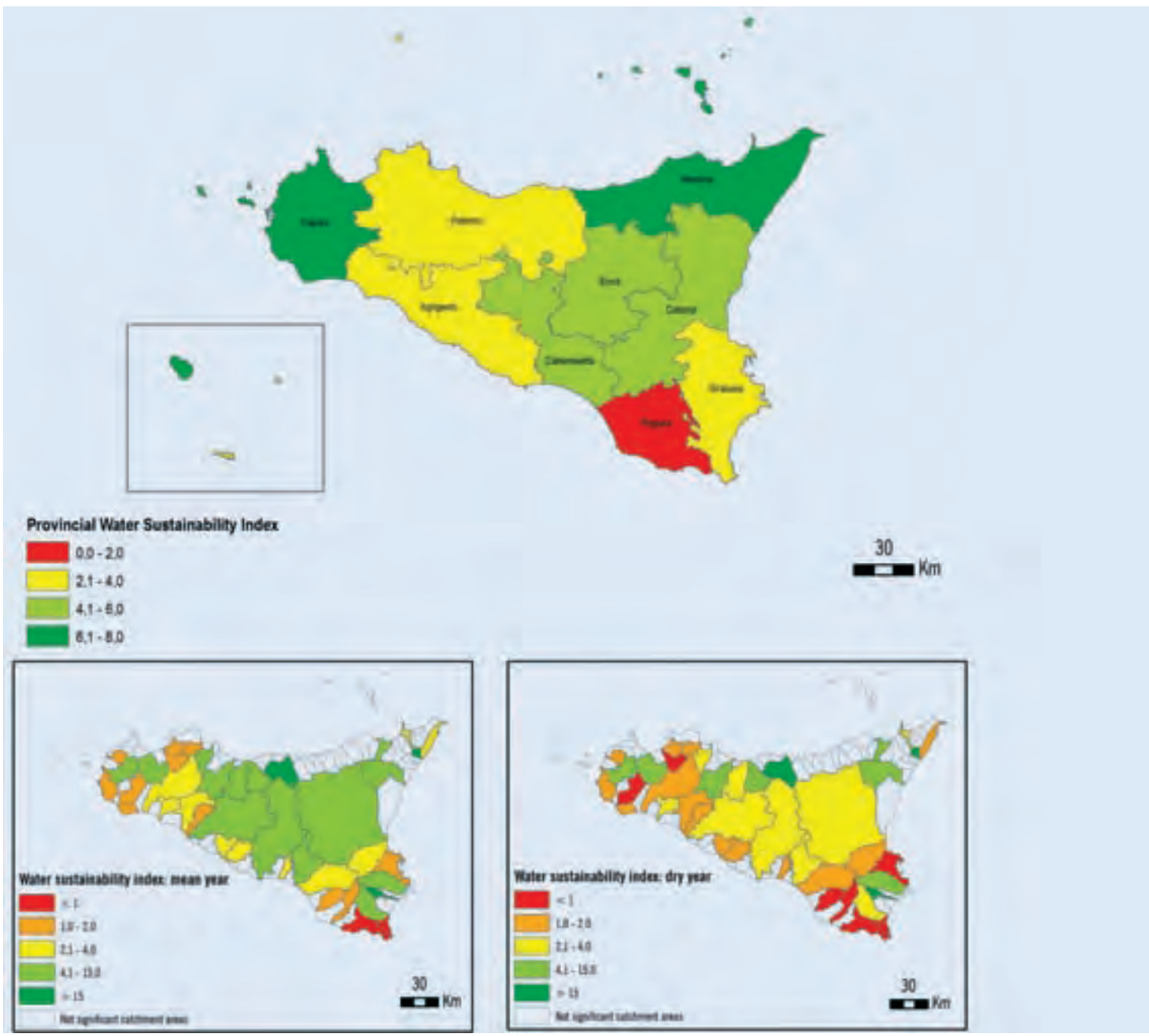
Key topic – challenge: 7. Disaster related risk and management of natural resources
Pillar: 3.7 Disaster related risk prevention / 3.8 Sustainable use and management of natural resources
Indicator description and other useful information: The indicator shows the percentage of emergency plans arising from natural phenomena: volcanic risk, hydrogeological risk, seismic risk, fires risk, etc

Indicator: 7.2 Percentage of population living in hazard prone areas

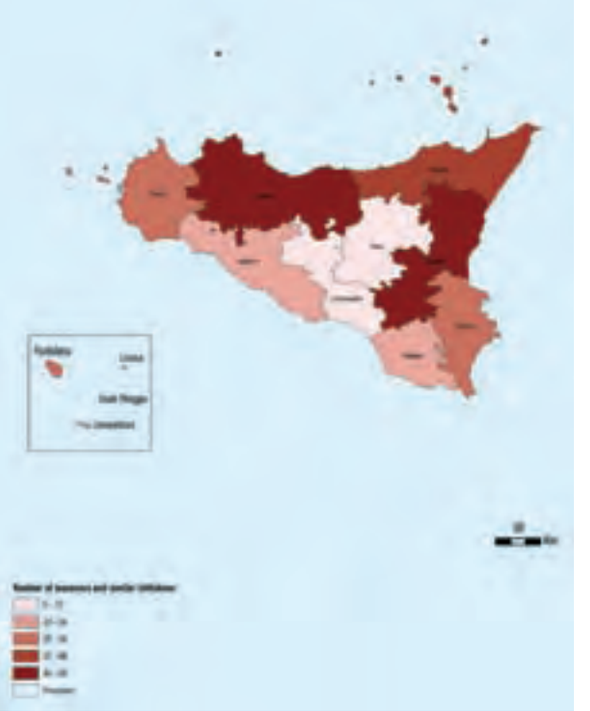
Key topic – challenge: 7. Disaster related risk and management of natural resources
Pillar: 3.7 Disaster related risk prevention / 3.8 Sustainable use and management of natural resources
Indicator description and other useful information: The percentage of national population living in areas subject to significant risk of death or damage caused by prominent hazards: cyclones, drought, floods, earthquake, volcanoes and landslides. The indicator is applicable to NUTS2 and NUTS3 Units. The indicator could also be calculated separately for each relevant prominent hazard. The risk of death in a disaster caused by natural hazards is a function of physical exposure to a hazardous event and vulnerability to the hazard.

Variation of percentage of companies using wide band fixed connection
Changes in the percentage of energy produced by renewable energy sources in primary energy consumption

Water sustainability index



Number of museums and similar institutions



Indicator: 7.3 Number of landslide events

Key topic – challenge: 7. Disaster related risk and management of natural resources
Pillar: 3.7 Disaster related risk prevention / 3.8 Sustainable use and management of natural resources
Indicator description and other useful information: The indicator represents the number of significant landslide events inside a territory

Indicator: 7.4 Number of seismic events

Key topic – challenge: 7. Disaster related risk and management of natural resources
Pillar: 3.7 Disaster related risk prevention / 3.8 Sustainable use and management of natural resources
Indicator description and other useful information: The indicator represents the significant seismic events for risk management at least at the second degree of the Richter scale

Indicator: 7.5 Number of volcanic eruptions

Key topic – challenge: 7. Disaster related risk and management of natural resources
Pillar: 3.7 Disaster related risk prevention / 3.8 Sustainable use and management of natural resources
Indicator description and other useful information: The indicator expresses the number of volcanic eruptions that occurred in a national territory

Indicator: 7.6 Number of alluvial events

Key topic – challenge: 7. Disaster related risk and management of natural resources
Pillar: 3.7 Disaster related risk prevention / 3.8 Sustainable use and management of natural resources
Indicator description and other useful information: The indicator shows information on flooding achieved the main meteoric phenomena occurred in the country and defines the most socio-economic significant effects related to them

Indicator: 7.7 Urban sprawl in coastal strips

Key topic-hallenge: 7. Disaster related risk and management of natural resources
Pillar: 3.7 Disaster related risk prevention/3.8 Sustainable use and management of natural resources
Indicator description and other useful information: the indicator shows the uncontrolled expansion of urban settlements onto semi-natural and agricultural areas, often along seaboards. It's also a measure of human pressure on seaboards trough the use of Corine Land Cover class "Artificial surfaces" (year 2006).

Indicator: 7.8 percentage of seabords with bathing prohibited

Key topic-challenge: 7. Disaster related risk and management of natural resources
Pillar: 3.7 Disaster related risk prevention/3.8 Sustainable use and management of natural resources
Indicator description and other useful information: the indicator shows the state of health of seabords relative to bathing; it's very important for Italy because it's among those indicators of Strategical Italian Framework (QSN) 2007-2013 with quantified goals. The target areas, EU Convergence Regions and the South of Italy, must achieve untile 2013 the value of 4,80% and 4,28 of seabords with bathing prohibited respectively.

Indicator: 7.9 water sustainability index

Key topic-challenge: 7. Disaster related risk and management of natural resources
Pillar: 3.7 Disaster related risk prevention/3.8 Sustainable use and management of natural resources
Indicator description and other useful information: the indicator shows the comparison between total usable resources of the catchment areas and water demand, divided by civil, industrial and agricoltural needs. Water balance evaluates human pressure on the quantitative state of water bodies throug an index of sustainability obtained as a match between usable resources and water demand.

Indicator: 8.1 Number of museums and similar institutions

Key topic-challenge: 8. Management of cultural resources
Pillar: 3.9 Sustainable use and management of cultural resources
number of museums and similar institutions
Indicator description and other useful information: the indicator expresses the density of non-state museums and similar institutions, meaning those institutions which have these charateristics: presence of permanent goods and colletions; public fruition of goods and collections; presence of an organized ways of fruition; opening during the reference year of the survey.

Variation rate of employed population

Indicator: 8.2 Number of cultural professionals in workforce

Key topic-challenge: 8. Management of cultural resources

Pillar: 3.9 Sustainable use and management of cultural resources

number of cultural professionals in workforce.

Indicator description and other useful information: the indicator expresses the strenght of cultural professionals in workforce compared to the total professionals in worforce.

Indicator: 9.1 Industrial Production Index: percentage of investment in capital goods

3.10.B.4.1 Industrial Production Index: percentage of investment in capital goods

Key topic-challenge: 9. Sustainability of regional economic resources

Pillar: 3.10 Sustainability of regional economic development

Indicator description and other useful information: the aim of the Industrial Production Index is to measure changes in the volume of output at close and regular intervals, normally monthly. Data are compiled according to the Statistical classification of economic activities in the European Community, (NACE Rev.2, Eurostat). The current base year is 2005 (Index 2005=100). The index is presented in calendar and seasonally adjusted form (Eurostat).

Indicator: 9.2 Variation in company spending on ICTs

3.10.B.2.1 Variation in company spending on ICTs (Thousands of Euro).

Key topic-challenge: 9. Sustainability of regional economic resources

Pillar: 3.10 Sustainability of regional economic development

Indicator description and other useful information: this indicator expresses the importance of ICTs for companies.

Indicator: 9.3 Changes in the percentage of companies with ISO 1400x and/or EMAS registration and/or ECOLABEL licences

Variation in the number of EMAS registration, UNI-EN-ISO 14001 certifications and Ecolabel licenses released.

Key topic-challenge: 9. Sustainability of regional economic resources

Pillar: 3.10 Sustainability of regional economic development

Indicator description and other useful information: this indicator evaluates the level of attention for environmental issues gave by companies. Data are shown in three different maps according to the different certifications considered.

Indicator: 9.4 Energy planning instruments for the chief cities

Energy planning instruments for the provincial capitals

Key topic-challenge: 9. Sustainability of regional economic resources

Pillar: 3.10 Sustainability of regional economic development

Indicator description and other useful information: this indicator is a proxy for measuring the complexity of energy and environmental management systems among local governments through the percentage of provincial capitals with approved municipal energy plan (up to 2009).

Indicator: 9.5 GWh/year of energy produced by renewable energy sources

GWh/year of energy produced by renewable energy sources.

Key topic-challenge: 9. Sustainability of regional economic resources

Pillar: 3.10 Sustainability of regional economic development

Indicator description and other useful information: this indicator expresses the independence of regional economic resources from traditional energy sources; it is also compatible with the objective fixed by the Europe 2020 strategy to increase the share of renewable energy sources in our final energy consumption to 20% by 2020.

Indicator: 9.6 Percentage of the population aged 25 to 64 having completed tertiary education

Percentage of the population aged 25 to 64 having completed tertiary education.

Key topic-challenge: 9. Sustainability of regional economic resources

Pillar: 3.10 Sustainability of regional economic development

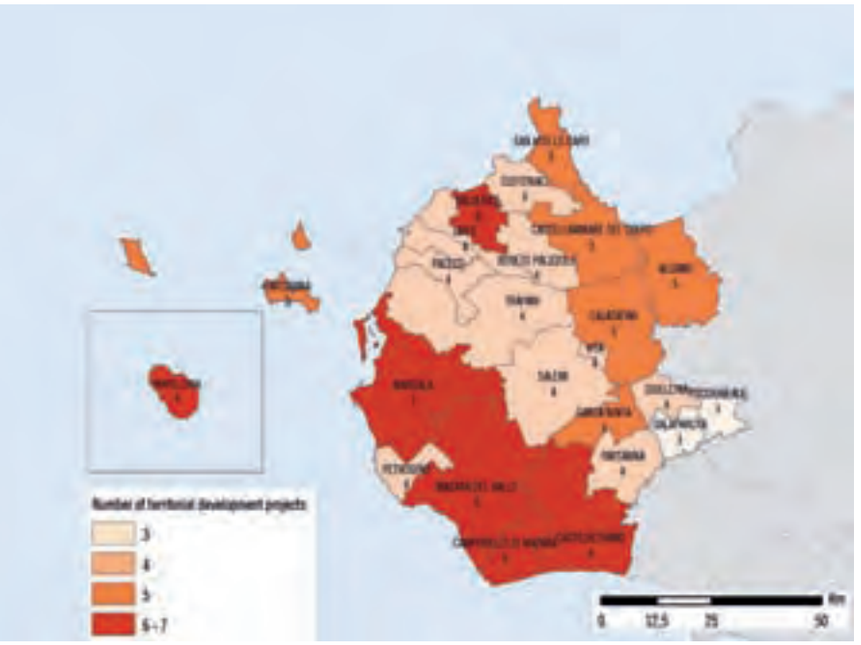
Indicator description and other useful information: this indicator expresses the qualification of the human capital, (people with university degrees and higher level vocational training certificates). European data (Eurostat) show that the regions with the lowest percentage of working age population with a tertiary education qualification are often rural or remote areas and islands.

Indicator: 9.7 Variation rate of employed population

Key topic-challenge: 9. Sustainability of regional economic resources

Pillar: 3.10 Sustainability of regional economic development

Indicator description and other useful information: this indicator shows the variation of the employment rate by Sicilian provinces from 2004 to 2011.



Number of Institutions involved in territorial development projects

Percentage of terrestrial protected areas to total of territorial areas

Indicator: 9.8 Existence of incentives for enterprises

Key topic-challenge: 9. Sustainability of regional economic resources

Pillar: 3.10 Sustainability of regional economic development

Indicator description and other useful information: this indicator shows if administration adopted specific measures to sustain enterprises

Indicator: 10.1 Variation in number of Institutions involved in territorial development projects.

Key topic-challenge: 10. Governance / Quality of life

Pillar: 3.11 Governability, social participation and quality of life

Indicator description and other useful information: this indicator measures the variations in number of institutions involved in territorial development projects considering the Leader+ programme, Italian "Contratti di Programma", "Patti Territiali", "Progetti Intergrati Territoriali" and PRUSST programme. Data refers to the European Structural Funds programming periods 2000 – 2006.

Indicator: 10.2 Public investment under current expenditure.

Key topic-challenge: 10. Governance / Quality of life

Pillar: 3.11 Governability, social participation and quality of life

Indicator description and other useful information: this indicator describes the composition of public spending through the ratio between public investments (costs that affect directly or indirectly on formation of capital) and current expenditures (expenses for various services provided by the public and for the redistribution of income for purposes not directly productive).

Indicator: 10.3 Percentage of institutions that have interactive on-line services.

Key topic-challenge: 10. Governance / Quality of life

Pillar: 3.11 Governability, social participation and quality of life

Indicator description and other useful information: This indicator shows the percentage of municipalities, under 10.000 inhabitants, that offer several kinds of on-line services; the presence and the level of efficiency of the services are expression of the interaction and participation between local government and citizens through ICT: "showcase web sites or informative web sites" that do not offer e-government services, or offer only information services; "sites with a showcase of forms" in which forms are available for downloading, but in which are neither available interactive information public/confidential, nor transactional services; "sites with interactive information" in which users can enable interactive processes of service customization, but no access to transactional services themselves (forms downloading may also be present); "sites with transactional services" that offer at least one transactional service; "sites with authentication services".

Indicator: 10.4 Percentage of 30-34 year olds with higher education qualifications.

Key topic-challenge: 10. Governance / Quality of life

Pillar: 3.11 Governability, social participation and quality of life

Indicator description and other useful information: this indicator follows the Europe 2020 strategy that says at least 40% of 30-34 year olds should have a tertiary degree or an equivalent qualification by 2020 (higher education, or tertiary education, is the level of education following secondary schooling). The indicator focuses on a band of relatively young population, providing data on recent higher education qualifications reached. It also shows clues on the attractiveness of the different regions on the job opportunities for graduates.

Indicator: 10.5 Percentage of population between 18 and 24 that has not completed secondary education.

Key topic-challenge: 10. Governance / Quality of life

Pillar: 3.11 Governability, social participation and quality of life

Indicator description and other useful information: this indicator measures the percentage of the population aged 18-24 with at most lower secondary education and not in further education or training. It is one of the eight headline indicators of Eu2020 strategy (the Lisbon Strategy set a goal of 10 percent of young people leaving school without an adequate qualification).

Indicator: 10.6 Variation of number of interregional cooperation projects.

Key topic-challenge: 10. Governance / Quality of life

Pillar: 3.11 Governability, social participation and quality of life

Indicator description and other useful information: this indicator shows the variation in the number of interregional cooperation projects under INTERREG IIIC (structural funding programmes period 2000-2006) and INTERREG IVC (structural funding programmes period 2007-2013).

Indicator: 10.7 Percentage of people aged 14 and more who has done voluntary works

Key topic-challenge: 10. Governance /quality of life

Pillar: 3.11 Governability, social participation and quality of life

Percentage of people aged 14 and more who has done voluntary works

Indicator description and other useful information: The indicator shows the capacity development of social services using the percentage of young people and beyond who has done voluntary works over the total of population same aged. Data include these categories: meetings in ricreative, cultural or other type associations; meetings in associations for peace rights, animals rights and ecological associations; free activities for voluntary organizations.

Indicator: 10.8 Variation rate of annual public spending on health

Key topic-challenge: 10. Governance /quality of life

Pillar: 3.11 Governability, social participation and quality of life

Indicator description and other useful information: the variation rate of annual public spending on health shows information on expenditure defined in the functionally area of health distinct by provider category (e.g. hospitals, general practitioners), function category (e.g. services of curative care, rehabilitative care, clinical laboratory, patient transport) and financing agent (e.g. social security).

Indicator: 10.9 No. of violent crimes per 10000 inhabitants

Key topic-challenge: 10. Governance/quality of life

Pillar: 3.11 Governability, social participation and quality of life

Indicator description and other useful information: this PicRm indicator is also one of the 13 “breaking variables” of the Italian QCS 2000-2006. It is similar to the Euostat indicator “crimes recorded by the police” included in “Population and social conditions and crime and criminal justice”. This indicator, in this particular instance, shows the intensity of violent criminal events per 10000 inhabitants.

Indicator: 10.10 Gini coefficient on social polarization

Key topic-challenge: 10. Governance /quality of life

Pillar: 3.11 Governability, social participation and quality of life

Indicator description and other useful information:. Gini coefficient, introduced by the italian statistician Corrado Gini, it’s a measure of the inequality among values of a frequency distribution. It’s often used as index of concentration to measure the inequality in distribution of income or richness. It’s a value number between 0 and 1. Low values of coefficient show that there’s a homogeneous distribution; the 0 value indicates the equitable distribution, for example the case in which everybody has the same income; high values of the coefficient show that there’s a more unequal distribution, with the 1 value that respondes to the highest concentration, or the case in which one person has the entire income of the state, while the others have zero income.

Indicator: 11.1 percentage of terrestrial protected areas to total of territorial areas

Key topic-challenge: 11. Landscape management

Pillar: 3.8 Sustainable use and management of natural resources / 3.9 Sustainable use and management of cultural resources

Indicator description and other useful information: this indicator measures the extension of protected areas over the regional or provincial territory.

Indicator: 11.2 Percentage of terrestrial protected areas with approved management plan over the total number of terrestrial protected areas

Key topic-challenge: 11. Landscape management

Pillar: 3.8 Sustainable use and management of natural resources / 3.9 Sustainable use and management of cultural resources

Indicator description and other useful information: the presence of plans is relevant as a misure of the level of protection and management in the protected areas, so this indicator shows how widespread is this kind of management plans in protected areas.

Indicator: 11.3 Number of cultural heritage sites with a management plan or plan for their use

Key topic-challenge: 11. Landscape management

Pillar: 3.8 Sustainable use and management of natural resources - 3.9 Sustainable use and management of cultural resources

Indicator description and other useful information: this indicator shows the level of protection and management of cultural heritage sites (archealogical sites, UNESCO sites).

Indicator: 11.4 Tourism intensity

Key topic-challenge: 11. Landscape management

Pillar: 3.8 Sustainable use and management of natural resources / 3.9 Sustainable use and management of cultural resources

Indicator description and other useful information: this indicator shows the general impact created by tourism activities on a territory. According to Eurostat Tourism intensity, also called carrying capacity, is the ratio of nights spent in hotels and similar establishments relative to the total permanent resident population of the area.

Interrelation among territorial factors and indicators

Territorial development and competitiveness depend on numerous territorial factors, their interplay and synergy. A greater selection of indicators for analyzing these factors is important because of the variety of calculating methods and different levels of geographical coverage. Many territorial indicators can explain more than just one competitive territorial factor, often because of having content and methodology related to various indicators.

The main tasks of this phase of work in the OTREMED project were:

- To assess the significance of individual indicators for more than just the basal competitive territorial factor;
- To assess the interrelation of competitive territorial factors considering the broader selection of indicators;
- To connect indicators in a matrix taking into consideration the additional material explaining the same competitive territorial factors;
- To define groups of related indicators.

The role of individual indicators in multiple competitive territorial factors was determined by expert assessment of similarities or direct connection of calculating indicators, identification of the alternative contents for competitive territorial factors that are offered by using related indicators, search for more functional and multifaceted use of indicators and the use of OTREMED indicators in related European projects. This assessment also dealt with the ability to analyze competitive territorial factors at different levels of geographical coverage of data in calculating indicators. The expert assessment made use of numerous sources: project reports, studies, scientific articles and EUROSTAT databases.

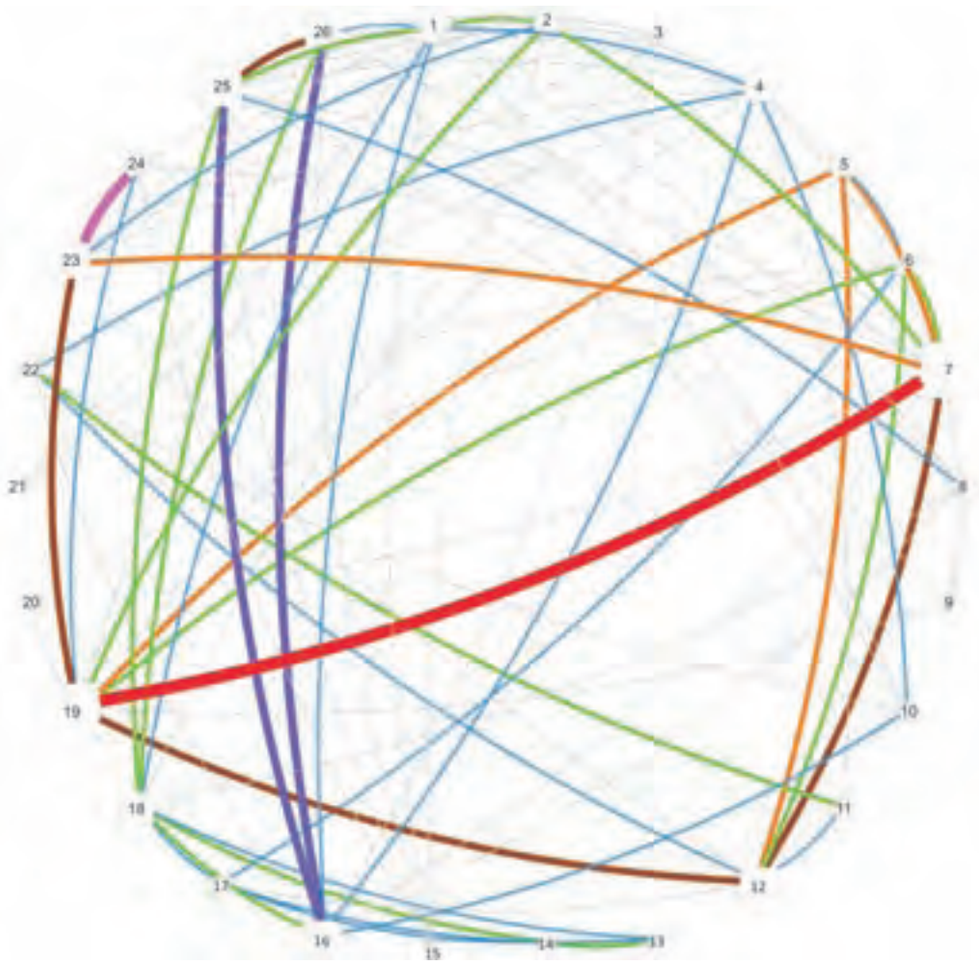
An expanded selection of indicators for each territorial factor demonstrates the connections at the other levels of treatment. The concurrent appearance of indicators within factors indirectly indicates the connections of the "key topics". The greatest number of these indicators measure phenomena in the following OTREMED key topics: sustainability of regional economic resources, revitalization of the urban system, governance/quality of life, and research & development. The smallest number of indicators is connected with the key topics: disaster-related risk, natural resource management, cultural resource management, access to transport, the rural crisis, access to ICT, and sustainable energy. These ratios indicate the preference for economic and urban structures over natural resources, rural areas, cultural resources, and transport networks.

Similar to the key topics, the connections between OTREMED competitive territorial factors can also be illustrated [Matrix 1].

Strong connections are characteristic for groups of following factors:

- Human capital - job market - quality of life/social exclusion - social capital - demographic trends - urbanization and soil consumption trends;
- Cultural capital - cultural heritage - tourism intensity;
- Integrated research systems - human capital - technical and technological innovation - job market;
- Energy diversification - green economy - renewable energy sources.

Matrix 1. Connections between OTREMED competitive territorial factors according to the number of common indicators.

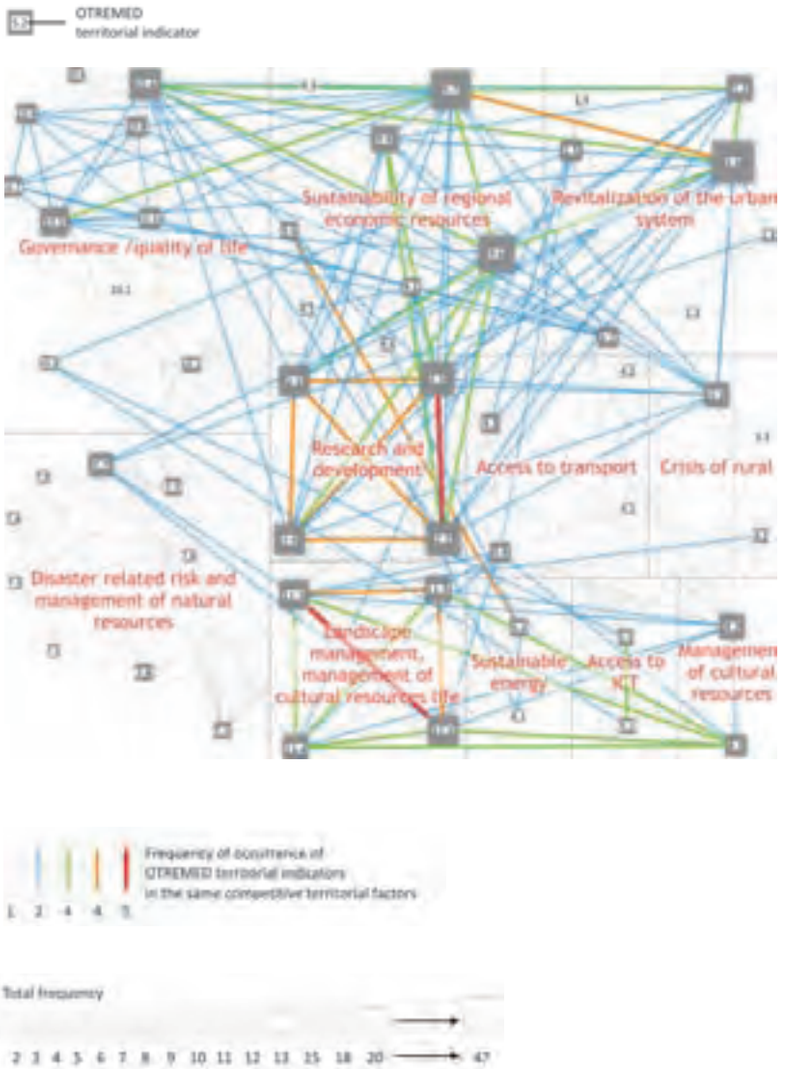


Competitive territorial factors:

1 Urbanisation and soil consumption trends
2 Demographic trend
3 Planning tools/practices
4 Services supply
5 Integrated research systems
6 Public and private investments
7 Human capital
8 Natural capital
9 Innovative agriculture
10 Integrated transport systems & multimodality
11 High-speed connections
12 Technical and technological innovation
13 Green economy
14 Energy diversification
15 Monitoring
16 Cultural capital
17 Technical capital
18 Renewable energy source
19 Job market
20 Public-private partnership (ppp)
21 Public-public partnership (pup)
22 E-government
23 Social capital
24 Quality of life/social exclusion
25 Cultural heritage
26 Tourism intensity

16 —— Competitive territorial factor

Matrix 2. Connections between OTREMED indicators according to the frequency of occurrence in the same competitive territorial factors.



Some competitive territorial factors indicate a high level of connection between groups of closely related factors (job market, technical and technological innovation, human capital, social capital, and cultural capital). Others are more dispersed but connected with multiple factors (urbanization and soil consumption trends, demographic trends, service supply). Factors in the area of transport infrastructure are relatively weakly integrated.

The indicators' connectedness is presented by the frequency of joint occurrences in the same competitive territorial factor [Matrix 2]. Joint occurrences are based on the content and methodological relatedness both of indicators and their base competitive territorial factors. Content relatedness of factors actually multiplies the number of connections between indicators, whereas isolated content produces a lower or even underestimated occurrence of individual indicators.

Indicators connected with a concrete competitive territorial factor represent a complex area for analysis and status assessment for particular content. The highest frequencies of interrelatedness are amongst others obtained by the indicators: increase of registered population, variation rate of employed population, percentage of active population with higher education qualifications etc. Some other indicators are more dispersed, they are connected with a greater number of indicators: urban sprawl/coastal urbanization, number of cultural professionals in the workforce, distance in time to basic facilities etc. Indicators with lower frequencies are often those that are difficult to calculate at spatial levels lower than the national level, indicators that evaluate natural resources in the area, and indicators concerning planning operatives and cooperation in domestic and international projects.

Some individual indicators [Matrix 2] are even more tightly interrelated, whether because of their interdependence when being calculated, their connection with the same statistical variables in the data sources, or their methodological and content interrelatedness.

Pilot projects

65

The Abruzzo pilot project

The Abruzzo Region is responsible for the implementation of one of the pilot actions foreseen by the project with the aim of collecting and classifying information which can describe the local dynamics from a demographic, technological, geological and economic point of view, on the basis of factors and territorial indicators developed in previous stages of analysis. The pilot action has made it possible to test and verify the applicability of the data and information at territorial level.
The collected data, properly georeferenced, have been entered on the portal SDIMED: this tool aims at supporting the decision-making process for an effective land-use planning, capable of identifying and harmonizing the whole Mediterranean area.
The Abruzzo Region has actively participated in the collection phase, firstly by identifying the geopolitical and social aspects characterizing its territory, and then by selecting the most significant indicators within the totality of those available. In the pilot project implementation phase, they were privileged indicators that are currently relevant for the regional situation and are linked to the development plans, to the potentiality of the urban system and to its demographic dynamics, to the heritage and landscape management, to the regional governance and sustainability of the economy and, certainly, to the relevant topic of new or renewed energy and technological resources. For each of these aspects, the analysis took into account local administrative units at LAU2 level and at NUTS3 level.
37 indicators were considered, some of these are useful to define the general socio-economic conditions, lifestyle and accessible services in terms of technology and transport. A second series has been specifically selected on the basis of geomorphological and landscape factors in Abruzzo, to better define the analysis and adapt it to the real local features: for a region that wants to make tourism, nature and sustainable development its flagships, it appears necessary to detect and evaluate indicators such as the groundwater status both in coastal areas and inland areas, the management of protected areas, the human settlement in areas exposed to risks, the management of the museum and cultural sector, the development of alternative sources of energy.

In detail, the 37 indicators are:

- Index of turnover of potentially active population
- Registered population
- Per capita medium gain
- Cultural professionals in workforce
- Population with higher education qualifications
- Employed population
- Public investment/current expenditure
- Population between 25 and 64 with higher education qualifications
- Population between 25 and 64 that has not completed secondary education
- Youth associations or groups / 10,000 inhabitants
- Distance in time to basic facilities (health centres, hospitals, university, airport, shopping centres, etc.)
- Households with broadband access
- Enterprises that use broadband fixed connection
- Percentage of investment in capital goods
- Company spending on ICTs
- Companies with ISO 1400x and/or EMAS registration and/or ECO-LABEL licences
- Health care expenditure
- No. of crimes / 10,000 inhabitants
- Museums and similar institutions
- Cultural heritage sites with a management plan or plan for their use
- Tourism intensity
- Mobility plans on a regional and / or local level
- Terrestrial protected areas to total of territorial areas
- Terrestrial protected areas with approved management plan
- Population living in hazard prone areas
- Landslide events
- Seismic events
- Coastal areas with bathing prohibited
- Water sustainability index
- Townships with emergency plans for the prevention of natural disaster risk
- Alluvional events
- Renewable energy development plans
- Energy produced by renewable energy sources in primary energy consumption
- Energy planning instruments for the chief cities
- MW/year produced by renewable energy sources
- Incentives for enterprises
- Institutions that have interactive on-line services

Photo. Coastal area of Pescara, Abruzzo. Italy

For each indicator, the analysis has regarded the territory of 11 municipalities (L'Aquila, Teramo, Pescara, Chieti, Vasto, Lanciano, Atessa, Avezzano, Sulmona, Alba Adriatica, Montesilvano) and of the 4 Provinces of Abruzzo (L'Aquila, Chieti, Pescara and Teramo) during the following years: 1990, 1995, 2000, 2005, 2006, 2010.

In order to obtain a more detailed framework, the pilot intervention has been focused on a well defined territorial area with a strong regional potential, which during the recent years has revealed itself to be crucial in the intervention programming process and for the implementation of development plans. This area is the so-called "The District of Wellness" which, in the context of an innovative and sustainable management, was established on the basis of a protocol between 14 municipalities belonging to the Province of Pescara. This District is aimed at creating a system of excellence through which the promoters municipalities (Abbateggio, Bolognano, Caramanico Terme, Lettomanoppello, Manoppello, Popoli, Roccamorice, Salle, Sant'Eufemia, San Valentino, Serramonacesca, Scafa, Tocco da Casauria, Turrivalignani) intend to characterize a typical production district in the area. The ultimate goal is to integrate the productive and the tourist systems, both at local character, supported by a network of operators of SMEs in the tourism and thermal sector, as well as in the other sectors related to them.

The district intends to develop tourism resources in the area, referring to the idea of wellness, understood as quality of life for visitors and tourists, which belongs to various aspects regarding the well-being: from gastronomy to the care of the body, from the life outdoors to recreational sporting activities, from landscape to cultural interests. From this point of view the territory covered by the pilot action seems to be extremely "featuring" of the Mediterranean area both in terms of available natural resources and of potentiality and development for a programmatic action.

The Sardinian pilot project

Laore Sardinia, the regional agency for the implementation of regional programs in agriculture and rural development, with the scientific direction of the Department of Civil and Environmental Engineering and Architecture (DICAAR), University of Cagliari, has developed a Pilot Project for rural territories that are characterized by the strong occurrence of agricultural production activities and by the quality of the landscape and the environment.

In the work preliminary steps, the official territorial and statistical Data Base has been analyzed in finding data to calculate the indicators proposed by the program. For each indicator, the metadata have thus compiled, the data sources availability and the chronological and spatial completeness have been reported. In this phase are highlighted some limitations that concerning the comprehensiveness of diachronic series of data and, especially, in reference at the spatial scale. At the scale of the project (NUTS 3, LAU 2) some factors are almost completely devoid of data, they are often published only at the regional level (NUTS 2) and sometimes the OTREMED indicators definition does not match perfectly with the available data **[table about data availability]**.

After this first phase, taking into consideration that one of main pillars of the EU strategy is the promoting of the development by bottom-up initiative, it was decided to focus the evaluation of the tool effectiveness at the LAU 2 scale, involving experts (politicians and technicians) from some municipalities characterized by prominent rural contexts.

During the first meeting, the experts were informed about the structure and the purpose of the project OTREMED and about the results of the preliminary analysis carried out on indicators, focusing on the limits and potential of the instrument SDIMED as a tool to support municipal and inter-municipal strategic planning activities. The severe lack of statistics data about the Urban planning instruments (which are, for example, plans and programs focused on mobility, energy efficiency, risk management, the management of environmental and cultural heritage resources, ...) has been identified as a key factor because sharing knowledge and best practices among various local authorities could support the establishment of harmonized strategies capable of enhancing local resources in a network system approach.

To overcome this limitation a experimentation has been proposed with the purpose to assess whether it is possible integrate the official data, adopted for the calculation of the OTREMED indicators, with bottom-up information provided through the direct involvement of experts from public administrations **[framework figure]**. The experiment is based on the compilation of a simple questionnaire focused on the issue of local governance, and aims to study the theoretical feasibility of a simplified interface to the imputation of some missing data at the LAU 2 scale. That interface could be outlined as a SDIMED plug-in or, in general, could constitute the base for the creation of a thematic Geo-DB in cloud represented with a WebGIS tools. The issue of governance was judged adequate for both its relevance to local competitiveness and because the close relationship with the institutional activities carried out by the experts should facilitate the retrieval of the data.

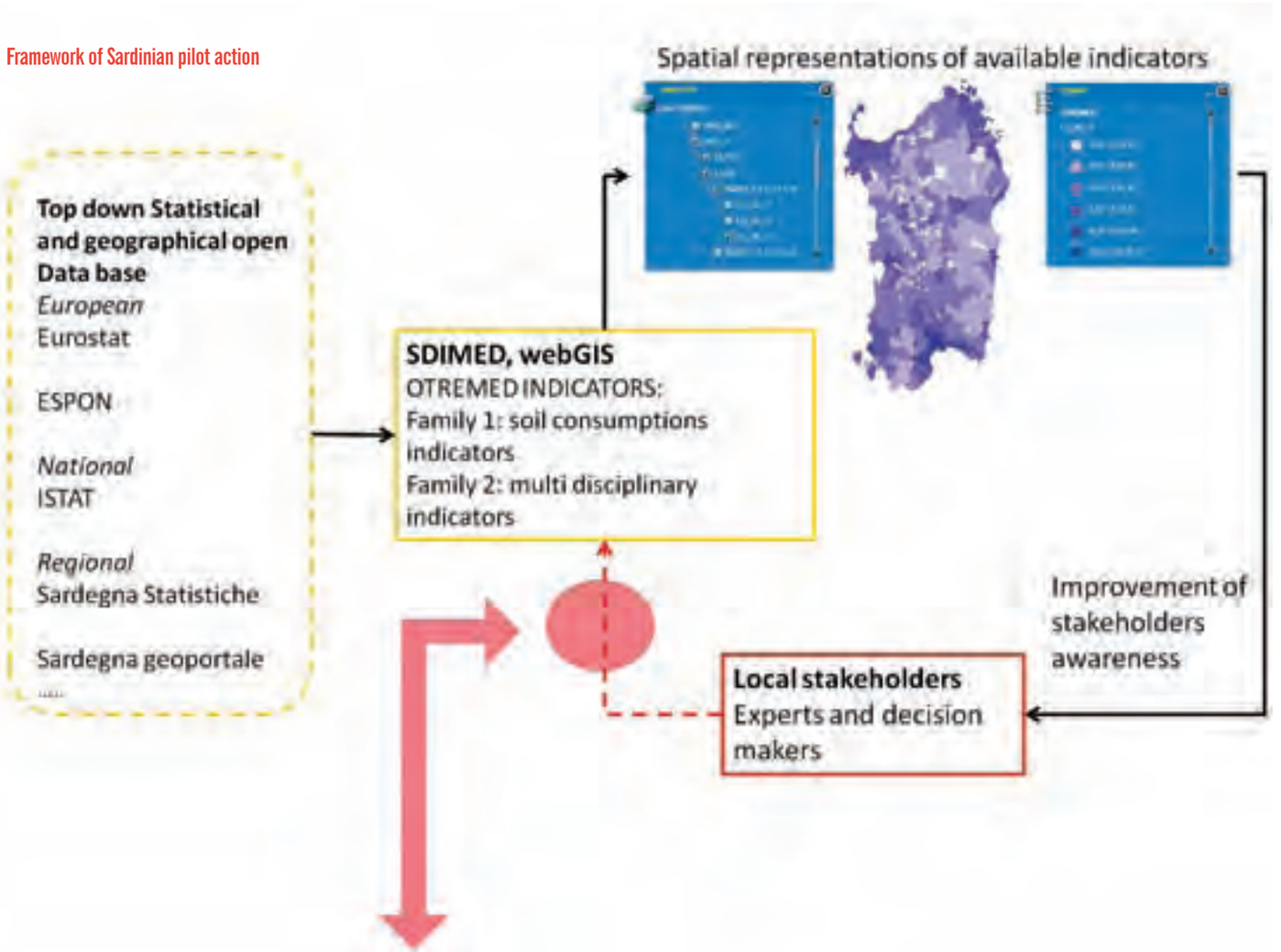
The experts involved were asked to provide basic information such as the year and the type of government instrument approved, regarding:

- town and country planning tools approved and in use in the municipality;
- policies and measures in use to encourage the development of local enterprises in agriculture, manufacturing and tourism;
- instruments for safeguarding and promoting historical and cultural heritage;
- measures and actions implemented to minimize the energy consumption and the production from renewable energy sources;
- public administration with interactive services online.

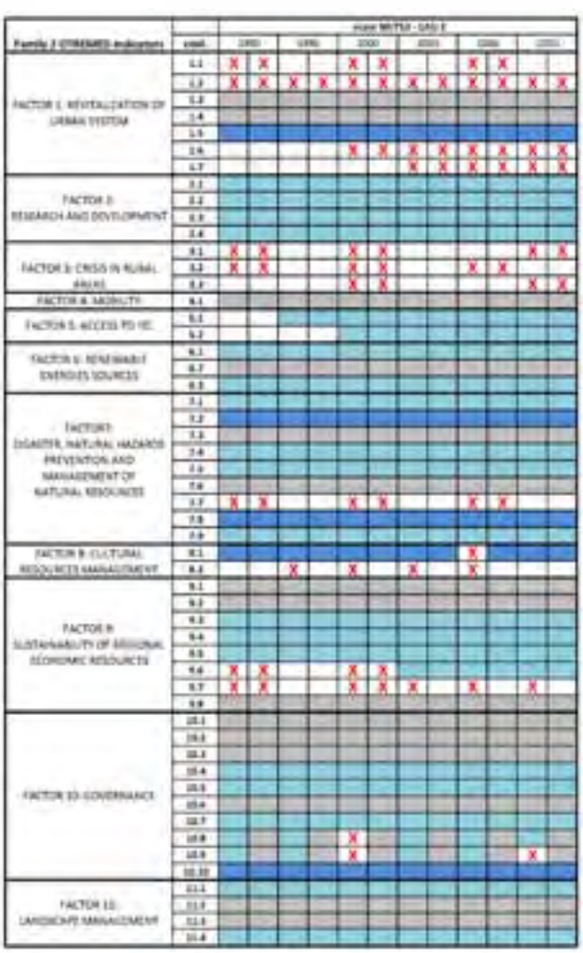
Testing on a small group of municipalities, after being refined and evaluated, the methodology could be implemented on a regional basis in the first instance, and then throughout the project area by defining a dynamic tool for monitoring the activities of planning and programming at the local level .

During the dissemination of the project results within the region, which will take place at two of the municipalities involved, it will be possible to verify the effectiveness of the methodology through feedback from experts. It will gather, also, more broadly suggestions from various local stakeholders about the effectiveness of the tool and of the methodology proposed to aiding in the strategic design process, and in the evaluation and monitoring of local development strategies.

Framework of Sardinian pilot action



Data availability of Sardinian pilot action



The Murcia pilot project

INTRODUCTION

The pilot action carried out in Murcia has given the oportunity to identify some weakness presents in the choosen indicator systems.

The methodology for preparing the final list of these indicators, which is trying to reflect the characteristics of the territories that make up the MED space has been complex to obtain, as it is documented in the report REGIONAL FACTORS, but the development of this pilot project has resulted in the identification of three major problems and a clear conclusion for future review.

DIFFICULTIES

The difficulties encountered in the development of the pilot project can be classified into 3 groups:

- Difficulties related to heterogeneous data sources and accessibility/correspondence with dates.
- Difficulties associated with working scale.
- Defects form in the definition of indicators.

Difficulties related to heterogeneous data sources, accessibility and correspondence with dates

The wide range of topics that attempt to characterize the list of indicators is the first difficulty encountered in carrying out the project, since a preliminary analysis of the databases available to address the indicators of the 11 topics / challenges has to be done.

The challenges proposed are very different, for example the challenge 7 deals with Disaster related risk prevention and management of natural resources and the 1 with the Revitalisation of the urban system, while 9 deals with the challenge of regional economic Sustainability.

Therefore, to find the specific data requested by the indices have been used to many databases and, at same times, although the data were not in line with the dates.

Different groups of the database have been identified. These database satisfying the requirements of the indicators in different ways:

- Population databases: demographics, municipal registers where we find all data related to migrations data, age groups, sex, etc., of the population. The population data are essential for the development of many of the indices of the project. But until 1996 annual registers were not developed and therefore there is not data for 1995. Population censuses are drawn every 10 years, with data in the first year of each decade (1981, 1991, 2011). The dates of developing indices of pilot projects were: 1990, 1995, 2000, 2005, 2006 and 2010 so as to population data have had to assimilate data from subsequent years in order to have data.
- Databases to query data related to economic issues, as investments in different fields (R + D, health, ...), where the methodological aspects are sometimes difficult to understand and difficult to conclude that the data collected for different dates are comparable or not. This is coupled with the difficulty of the variety of economic variables measured.

An example are all indicators that you have to refer to investments in different areas.

Over the years they have improved methodologies for the development of statistics and it is visible incorporating novel methodological procedures related to current developments in spatial data techniques that make us doubt whether they are comparable data from different dates. An example is the index 2.2 Research Development Expenditure of public institution whose definition "*Expenditure on research and development (R&D) can be considered as an investment in knowledge that translates into new technologies as well as more efficient ways of using existing resources of physical and human capital. Indeed, in the case of R&D, there seems to be stronger consensus that it may have a persistent effect on growth. The index is calculated by comparing values of expenditure in R & D in different years and calculating percentage of variation*".

For the preparation of this index has been used Spanish Regional Accounts, specifically Total domestic expenditure on R & D in relation to GDP per year, which is recorded notes warns that:

- From 1981 to 1994: GDPpm basis 1986 BILLIONS OF CURRENT PESETAS
- From 1995 to 2000: GDPpm basis 1995 MILLION
- Since 2000 (*): GDPpm basis 2000 MILLION
- Since 2009 (**): GDPpm basis 2008 MILLION
- The data for 2001 (*) onwards include continuous and occasional R & D.

In other cases data are not included in traditional databases but in another type of inventory, which make data collecting is an arduous and difficult work. For example, with respect to the index 10.7 Number of youth associations or groups / 10,000 inhabitants in Spain was no statistics on youth associations, but it is required by law to have an inventory by regional administrations where they register the associations. It has had to resort to a list of more than 1900 pages of the Register of Associations to find all youth associations, the starting year of activity (and year of cessation activity) and the municipality to which they belong in order to post them. Another example is the index 7.6 Number of alluvial events. For the preparation of this index has been used the National Catalogue of Historical Flood (Updated 2011), prepared by the Directorate General of Civil Defense and Emergencies of the Ministry of Interior. It has had to examine all the episodes in the years and look desired geographical location. More examples of this type is the corresponding index 10.9 No. of crimes / 10,000 inhabitants, for which they have had to consult safety statistical yearbooks: crimes and misdemeanors and arrests from the Ministry of Interior.

Difficulties associated with working scale

The most important of the difficulties identified is the absence of lot of data at the required level. Some of the required data are available only at the national level and some as important as those related to the 9.1 Industrial Production Index, information necessary to characterize the productive activity in an area. However, as reflected in the official website of National Statistic Agency the development of this index is available in nationwide to Spain. In order to obtain this index it i performing a continuous monthly survey that investigates every month more than 13,200 stores across the country, so the breakdown by territory could be developed and made available to potential users. Another example would be 10.10 Gini coefficient index for which data are only published nationally.

Most databases have not published the data at the municipal level. It would be desirable a feedback between data producers and data users, since it is assumed that data processing to a higher level (regional) previously should be developed at the municipal level, and those municipal data could be used.

To prepare the index 3.3 Ratio of agricultural area used for organic production and total UAA is required the total hectares dedicated to agricultural production and agricultural hectares dedicated to organic production. The total hectares dedicated to agricultural production can be found in the statistical operation prepared by the INE (National Statistic Agency) Agricultural Census 2009 and the hectares devoted exclusively to organic production, but not at the municipal level. To find the data at the municipal level were contacted Regional Statistic Center from Murcia and in a very short period of time were submitted the selected information at municipal level.

Defects form in the definition of indicators

One aspect in which they can improve the system of indicators proposed by OTREMED project is to improve the definition of the specific data to collect.

An example of this can be in the index 8.1 Number of museums and similar institutions, whose definition in the Report Selection of Indicators OTREMED is "*The indicator expresses the density of museums and similar istitutions. Ratio between the number of museums and similar istitutions and the extent of a specific territory*", but here a questions is showing up: what are similar institutions? This could include from art galleries to cultural centers which remain permanent and temporary exhibitions. The absence of a clear definition of the index can produce both quantitative and qualitative errors and could result in heterogeneous data comparison between the different pilot projects carried out along the MED space.

For our pilot project this question was solved using the Directory of Museums and Collections of Spain which is the largest and most comprehensive database of museums and museum collections in our country, which includes the institutions that are officially recognized as such by the Communities regions by legislation in which they are located through the definition of a museum or museum collection and the requirements that each institution must meet for it. This is a public information service to citizens of all museum institutions of Spain, a platform from which is reported its characteristics and encourages them to visit. At this point comes into account the legal definitions of each territory to discern what is and what is not museum, and if these definitions are homogeneous along the whole MED space and therefore if those data are comparable data. Another example which shows that it would be advisable a better definition of the indices to study is the indicators relating to economic and investment (or expenditure) issues. Should be complete definitions of the specific variable rates being demanded. There are different types of expenses or investments, from overhead costs and personnel expenses and they miss more concrete data specification that you need to gather.

CONCLUSIONS

As main conclusion of this pilot project it highlights the need to present to the different "creators" of data the specific needs of users, so that they can give a value-added to all data collected and processed by the statistical offices or agencies responsible for the records.

It would be desirable the design of a mechanism-protocol for producers of these statistics data which supply more direct contact with data users and which could help to have a clear comunication in order to meet the users requirements, if not for each particular user in a more generally way. It would be desirable producers know why and how are going to be use these data in order to put a higher value on those data. If not, the effort to gather the information, process and publish information would be useless, becoming inert data. An example of this is the previously mentioned index 3.3 Ratio of agricultural area used for organic production and total UAA, which thanks to the mechanisms of communication with the regional office of statistic has been worth existed data but not were published.

Assessment of project by board of expert and technical workshops

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Project evaluation by technical board and round tables

The organisational structure of the project is based on Association. The partners' support bodies provide the necessary technical and administrative resources and act as operative stakeholders in all the project stages. OTREMED is, however, a complex project, which covers a number of interrelated and interdependent actions that require adequate coordination and evaluation in order to guarantee that the project will reach its intended objectives. Therefore, despite the fact that all the partners play an active role in each line of work, a coordinator has been appointed in each area to ensure the satisfactory performance of the tasks. In addition, and as an external element to the association, the project agenda contemplates the constitution of a Board formed by five experts of recognised prestige in territorial planning, elected by voting on the basis of a list presented by the partners. The purpose of the Board is to analyse in detail the scientific and technical results obtained and the methods used in the different stages of the project. These stages have been as follows:

- Territorial characterisation of the Mediterranean Space.
- Identification of territorial factors.
- Selection and definition of indicators.
- Evaluation of the results of the application and the pilot projects.

The Board members were elected in such a way as to represent, proportionally and by nationality, the variety of partners who participate in the project. Of the five experts who form this Board, four belong to the countries of origin of the partners: two have been elected by the six Italian partners, one by the three initial Spanish partners (the Region of Andalucía was an initial partner in the project, leaving at its own accord when the project was at the half way stage) and one by the partners from Slovenia, Greece and Portugal. The fifth represents the countries of the European Union that do not participate in the project and was elected by the Mediterranean Institute.

With regard to its functions, the Board of Experts meets at the end of each stage of work. At each meeting, one expert takes the floor as speaker. The speaker studies the documentation prepared by the partners and prepares a preliminary report which he communicates to the other experts prior to the meeting. During the meeting, the experts debate on the report and agree to conclusions which are included in the definitive report that is communicated to the Steering Committee, which analyses it and takes its proposals into consideration.

The members of the Board of Experts are the following:

Representing Italy

Arnaldo Cecchini Architect, professor of the University of Sassari (Sardinia), Dean of the Faculty of Architecture, expert on models and techniques of territorial analysis, with particular reference to the application of new information technologies that serve as a support to territorial planning.

Valeria Pulieri Consultant of the University of Rome "La Sapienza-CATTID", expert on territorial ecology.

Representing Spain

Joaquín Farinós Dasí Geographer, professor of the University of Valencia and expert researcher on territorial planning and sustainable development and an analyst of European Regional Policy and Regional Development Policy.

Representing Slovenia, Greece and Portugal

Simon Kusar Geographer Professor of the University of Ljubljana, expert on territorial and spatial planning, as well as on economic and urban geography, especially on the use of qualitative and quantitative methods in territorial planning processes. Member of the Executive Committee of the Ljubljana Geographic Society.

Representing the non-participating companies

Giuseppe Sciacca Head of the international cooperation programmes of the CRPM (Conference of Peripheral Maritime Regions).

The first meeting of the Board was held at the headquarters of the Region of Lazio, in Rome, on 11 March 2011. At this meeting Simon Kusar acted as speaker. The object of study was the Project Methodology and the Territorial Development Model of the Mediterranean.

The work carried out by the partners, which was debated by the experts, was that included in the following phases:

- Phase 3.1 Capitalisation of Previous Work
- Phase 3.2 Compilation of Cartographic Data
- Phase 3.3 Territorial Model of the Mediterranean

The experts issued the following proposals, which were taken into account in the final conclusions of the different phases:

Phase 3.1. Capitalisation of Previous Work

The expected result is a compilation of the different territorial documents that have been produced in the Mediterranean regions. This compilation should be relatively ample and the relevance of each document to the OTREMED project should be indicated, in order to be able to identify its application in the subsequent steps of territorial analysis. The experts recommend that this compilation should be published on the Web site of the OTREMED project.

Phase 3.2. Compilation of Cartographic Data

The idea is to compile the cartography that will serve as a foundation to support the spatial data infrastructure of OTREMED. This mapping should therefore be common and standardised throughout the MED territory and it should comply with the INSPIRE Directive. It is essential to pay special attention to its adaptation to the data to be supported, in relationship with the technical characteristics of the GIS systems used in the different partner Regions.

Phase 3.3. Territorial Model of the Mediterranean

The objective of this phase is the identification of the current territorial models and trends of the MED space. The starting point for the completion of this phase should be the compilation of previous studies and research, completed in Phase 3.1, and the 11 competitiveness challenges identified in the PIC-RM project. The Characterisation of the MED space should be performed via a holistic focus, not via the compilation of all the information possible on the territorial characteristics, but only that which is related with the specific spatial and regional problems, together with the actions and measures that have been defined in the regional agendas to resolve them. The result of this evaluation should be the definition of specific models for territorial organisation of the regions, which can subsequently be integrated in the Territorial Model of the MED, which will show the basic territorial characteristics of the MED space. This specifically regional, bottom-up focus will allow the integration of the territorial diversity of the MED Macro-Region in the methodology of the project.

The starting point for the construction of the territorial model of the MED is the qualitative analysis of the system of indicators developed in the PIC-RM project. These are appropriate indicators by which to measure levels of territorial development and competitiveness. 357 indicators are proposed in that project, which seems a very high number, owing to which they should be classified according to their qualitative (oriented towards territorial policies) and quantitative (for obtaining spatial levels) relevance, as follows:

- Strategic (key) indicators: necessary to understand and represent the main trends and policies at all scales.
- Relevant (important) indicators: very important for understanding the dynamics or policies at different scales.
- Secondary (useful) indicators: significant in understanding a dynamic or policy and also useful for other scales.
- Sectoral indicators: relevant only for a specific sector or scale.
- Non-relevant indicator: useful for understanding some dynamics that do not belong to the central strategy of the MED.

In conclusion it is appropriate to point out the following observations: The specificity of the MED should be presented very clearly. The basic selection of indicators should be reduced but significant. The processes should be guided towards the calculation of a new set of indicators, based on relative numbers (indexes, densities) and their identification should not be conditioned merely by current advances in the technique.

The Second Meeting of the Board was held in the Region of Lazio, in Rome, on 6 October 2011. The speaker at this meeting was Joaquín Farinós Dasí.

The object of study was the Characterisation of the Mediterranean Space and the Selection of Territorial Factors and Indicators.

An indication was given of the importance of establishing the territorial scales at which the indicators are to be applied, and the conclusion reached was that it is necessary to reach the most reduced scale possible. In this case, taking into account the territorial nature of the MED space, the importance of the local scale was debated, from the point of view of OTREMED, and it was agreed that the minimum scale of work should be NUTS 3, although it is recommended that the LAU 2 scale be used where possible.

With regard to the geographic area covered by OTREMED, a debate was held on the convenience of contemplating the whole Mediterranean, with a view to territorial coherence but, considering the extreme difficulty that this would involve, the conclusion was reached that the project should be limited to the 48 regions of the European Mediterranean, but without losing sight of the territorial globality of the Mediterranean as a whole.

The experts coincide on the importance of carrying out a satisfactory integration between the internal diagnosis, highly developed in the project, and the external diagnosis, when defining the Territorial Model of the MED space. To characterise the Mediterranean, it is necessary to find very simple common denominators, respecting regional diversity. It is a matter of "harmonising" rather than "standardising".

With regard to territorial factors, they make a series of observations regarding the importance of their classification between those which are strategic and those which are not. It will also be necessary to take into account that the first category may include some which are difficult to evaluate. The factors should be common and simple, seeking territorial harmonisation. From the point of view of time scales, it is important to define factors for the medium and long term, never for the short term.

A specific and short list of indicators should be defined, concentrating mainly on the economy and competitiveness, but not forgetting those related with growth and the environment.

The set of indicators should be considered as a System, that is, it is not a question of defining individual and independent indicators, because they should offer a coherent view of the Territorial System of the Mediterranean.

The question is raised as to whether the choice of indicators should be conditioned to the availability of the data in the statistics offices, the conclusion being reached that in principle the existence or non-existence of data should not be an impediment for the definition of an indicator. The definition of indicators for which data are not available could be a good starting point for entering into a relationship with those bodies with a view to making them aware of the importance of their availability.

A reminder is also given that the space is much more closely related to flows and networks than to areas (concept of "blurred boundaries") owing to which the indicators should not be of a merely quantitative nature, the qualitative nature of certain indicators is also necessary in order to make an adequate territorial diagnosis.

The first and the second meetings of the
Board of Experts, of the Otremed project

The third The fourth meetings of the Board of Experts, of the Otremed project.

The Third Meeting of the Board was held at the headquarters of the Region of Piedmont, in Turin, on 24 February 2012. The speaker of this meeting was Arnaldo Cecchini.
The object of study was the Mediterranean Territorial Model, Development of Territorial Factors and Guidelines for the Selection of Indicators.
The Board considers it important that the choice of factors and indicators should respond to the objectives of OTREMED, as a foundation for the creation of a Mediterranean territorial observatory, owing to which it is necessary to define those objectives previously, differentiating between the short, medium and long term.
It is necessary to define the key factors for the territorial strategy it is intended to provide.
The indicators should be given a hierarchy according to their strategic importance, their number should be reduced and they should be defined in greater detail.
Preference should be given to dynamic indicators and those referring to individuals, human capital should be considered basic for competitiveness.
Special emphasis is given to the scales for which the indicators are defined, the conclusion being reached that the appropriate scales for obtaining the planned objectives, in relationship with the Nomenclature of Territorial Units for Statistics, defined by Eurostat, should be NUTS 3 and LAU 2. Special care must be taken that the territorial comparison is made in areas with homogeneous characteristics.

The Fourth Meeting of the Board was held at the headquarters of the Region of Murcia, on 21 March 2013. The speaker at this meeting was Valeria Pulieri.
The object of study was the implementation of the territorial indicators in the Pilot Projects, the evaluation of their development and the presentation to the Board of Experts of the Spatial Data Infrastructure of the MED, named SDIMED.
Attention was drawn to the difficulties found during the development of the pilot projects, fundamentally the modifications of the territorial structure which are being carried out in different regions (for example, in Slovenia and Greece), which prevent the collection of homogeneously comparable data, especially those that use the time factor and are related to territorial dynamics.
For the family 1 indicators the Corine Land Cover database has been used. This covers the Mediterranean regions almost entirely, and in this way coverage can be given to data of all the indicators of this family. However, precision is very poor, it does not distinguish areas of below 25 has, which creates distortions in territories that cover a small area.
The lack of availability of data in digital and transferable format has created many difficulties, since the majority of the data have had to be downloaded manually.
The problem posed when wishing to represent areas that do not have data, compared to others in which the data has a value of zero. It is necessary in these cases to differentiate between both situations.
Attention was drawn to the great difficulty in obtaining comparable data for a certain number of indicators and at different scales. This topic is developed in greater precision in the section on pilot projects.
It is considered important that indicators that are considered strategic should be conserved, even though data may not have been found, because they may be obtained in the future.
It is important to define a standardised method to define the data intervals. These should be adapted to the type of indicator in question.
It would be convenient to include indicators on Tourism, Desertification, Fires, Erosion, Floods, Quality of Life, Quality of Nutrition.

CONCLUSION

The review of the different project phases by the experts in territorial planning has been extremely valuable in order to comply with the project objectives. Their observations have been carefully analysed by the partners responsible for the different lines of work, and, wherever possible, the recommendations which ostensibly improve the results obtained have been incorporated.
Their collaboration has contributed to the acquisition by SDIMED of sufficient quality to become the basic instrument of the Observatory Network for the Mediterranean Regions. As a live instrument which has its raison d'être in the character of the Mediterranean space, and which has been structured according to a territorial analysis with the objective of designing strategies to develop certain challenges of competitiveness.

SDIMED
Obervatory of the territorial strategy of the MED space

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SDIMED Spatial Data Infrastructure. Concept and components

A Spatial Data Infrastructure, also known as a Geographic Information Infrastructure, is an information system formed by a set of data and services (described via their metadata) which are managed via Internet, according to standards that regulate and guarantee the interoperability of their data and political agreements that allow users, by means of a simple browser, to discover, view, access and combine the Geographic Information according to their needs (definition according to IGN, Spain). This information system is formed by a set of computer resources such as databases, data catalogues, service catalogues, map servers, web pages, viewers, etc.
The geographic information managed by an SDI may take the form of satellite images, orthophotos, maps, geographic names, information layers of a GIS... This geographic information to which access is required must comply with certain rules and standards and the ICT resources must comply with specifications, protocols and interfaces that guarantee interoperability.

1.1 COMPONENTS

An SDI, as a distributed Geographic Information System, is a working server that publishes maps and data on the Internet. From the point of view of technology every SDI has three basic components: geographic data, metadata and services. But it is important to remember another component with an essential role: organisation.
These components are detailed below.

1.1.1 Geographic data

These are any data that, directly or indirectly, refer to a specific geographical location or area. According to the type of information represented by the geographical data they can be classified as:

- Reference Data: these are fundamental geo-referenced data that serve as a foundation on which to build or reference any other set of thematic data. They fulfil the same role as basic mapping and serve a general purpose. They generally originate from direct observation of the land such as, for example, restitution, a geographical survey or a geodetic observation, topographic maps, administrative boundaries, etc.
- Thematic Data: these are data based on geographic reference information, they singularise or develop some specific aspect of the information contained or incorporate specific additional information, for example a climate information map or a layer of soil information.

1.1.2 Metadata

Information that describes the geographic data sets and geographic information services and which makes it possible to locate, inventory and use them. In other words, these are the data regarding the actual data sets or services, such as, for example: the date of the data, the format, the owner, the geographical location, the price, etc. The advantages of metadata can be categorised according to who uses them and they include some of the following:

Advantages for the user of geographic data:

- The metadata assist users in finding the data they seek.
- They allow the user to know the characteristics of the data: date, author, quality, etc.

The metadata allow the geographic data professional:

- To know how up to date the data is and its quality.
- To know the collection and storage processes.
- To know the legal limitations for use and distribution.
- To know the contact person.

In addition to the advantages listed above, for the Mapping Organisations and Agencies that produce data:

- The procedures for data management are improved.
- They help to protect the investments made.
- They provide information regarding data sources and qualities.
- They save time and reduce costs.

Metadata can be applied for three types of work:

- To locate data: Where are the data of the kind I need?
- For analysing the information: Do these data have enough information for the analysis I need?
- For the use of the information: How can I use these data and combine them with other data to obtain a new product?

1.1.3 Services

These are the functionalities, accessible via an Internet browser, that an SDI offers the user to be applied to the geographic data. These functionalities are organised in services: viewing of maps, downloading, locating, etc.

- Web Map Service (WMS)
  This allows viewing of a cartographic image generated from one or various sources: a digital map, data of a GIS, orthophoto, etc., originating on one or various servers. Optionally it offers the possibility of consulting their attributes.
- Web Feature Service (WFS)
  This allows access to the data themselves, to the geographical features, in GML format. Vector information of the data, such as a river, a city, a plot, etc. is available.
  WFS-G. is a specific example of the WFS but applied to Gazetteers since it offers the possibility of locating a geographic object with a given name and consulting the associated attributes. It is a very important web service, since it is the most natural way of selecting the area that the user wishes to view or consult.
- Web Coverage Service (WCS)
  This service is similar to the WFS but for coverage, raster data such as, for example, digital models of the land or satellite images.
- Catalogue Service for the Web (CSW)
  Thanks to this service the required geographic information can be searched on the basis of the metadata by which it is defined.

1.2 PILOT ACTIONS TECHNOLOGY TO BE USED

A totally integrated open source platform will be used to serve maps and data via a web application, built on open source technology that combines:

- **PostGIS** provides a fast and powerful database to respond to requests for spatial and alpha-numeric queries. The data can be loaded in the PostGIS DB by using graphics tools included in the application, such as the Shapefile Importer plug-in included in PgAdmin III, or from a utility of the actual web interface of GeoServer. This allows integrated and efficient management: as well as benefitting from the power of the PostGIS itself, it is possible to access the data and edit them using a multitude of external desktop tools.
- **GeoServer** is a map server that provides access to GIS data sources and high quality cartographic maps via web standards. The services and contents of GeoServer are fully manageable from a web interface via authentication, which facilitates the publication of data on the intranet, their symbolisation, metadata production, and even the definition of access levels to different data sets according to different user profiles.
- **GeoWebCache** intelligent storage of tiled maps which serves them via standard protocols to guarantee the scalability of the geoservices.
- **OpenLayers** is the de facto standard for custom web mapping clients. It is able to consume multiple sources of maps and provide tools for the editing and collection of data.
- **GeoExt** is a framework based on ExtJS that includes standard user interface components for building web GIS applications with the appearance and functionality of desktop applications.
- **Geonetwork** will be used as a catalogue service. For the editing of metadata, as well as the interface offered by Geonetwork another editing tool will be provided: Catmdedit.

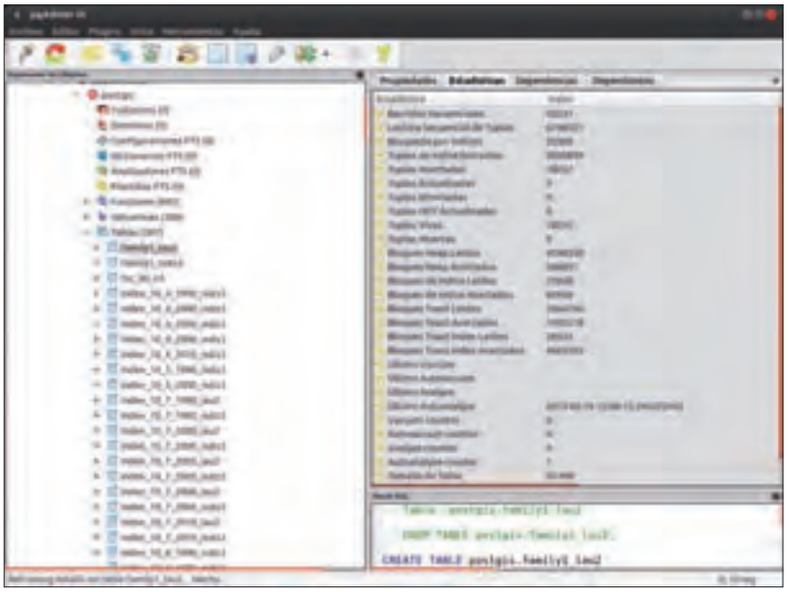
The pilot system will be rolled out on free distribution software: Unbuntu Server 12.04 (AMD64). In any case, since the applications and services are independent from the platform, any other OS and distribution can be chosen: Windows, Linux, MacOS, etc. Once the whole system is installed and configured various alternative methods are proposed for its dissemination and subsequent evaluation:

- Migration of the pilot server to a virtual machine. This will allow the server to be imported onto a virtual machine so that, once evaluated, it can again be migrated to a physical server.
- Partial or total installation of the system by following a step-by-step guide which details the installation of the whole system (OS and applications or applications only).

1.3 INTEROPERABILITY AND FLEXIBILITY

Since an open architecture is used, the system can be completed, enlarged and/or improved with other systems, either free or proprietary. The diagram below summarises how it can substitute or interact with other solutions currently on the market and at which level. [1]

1. Interoperability



2. PostGis example view

SPATIAL DATABASE

Originally, GIS systems worked with very specific and determined file formats, such as, for example shapefile. Although this, like other format types, has become generalised and is currently accessible via any kind of software on the market, it presents a series of limitations, such as access to the information by various users at the same time, file corruption or computational speed in complex functions, as well as the need to rewrite code appropriate for each system.

At data level, most of these disadvantages are solved with the use of database management systems, since they add support for multiple users, good performance for large data sets and the possibility of complex queries. This is why the idea arose to provide these systems with spatial capacity, eliminating the disadvantages mentioned above.

2.1 PostgreSQL

PostgreSQL is an object-relational database management system. It uses a client/server model and is distributed under BSD licence, which allows its use, redistribution and modification, the only restriction being that the copyright of the software must be maintained for its authors. With an extensive community of active users and constant development, it has for many years been one of the most widely-used systems, since it combines several advantages, including the following:

- It functions on multiple platforms, which guarantees independence of the software.
- Easily extensible.
- Support for standards.
- Great robustness, reliability and transactional integrity. It uses multiple processes, which guarantees stability of the system: one fault in the process does not affect the rest.
- Generalised search tree (GiST) to allow R-Tree.
- There is no limit to the size of the columns for support of large GIS objects.

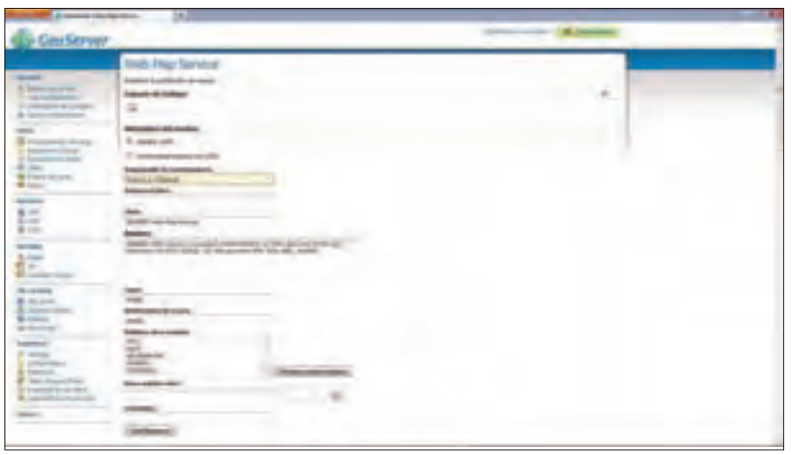
2.2. PostGIS

PostGIS is a spatial database. To be more precise, PostGIS is an extension that converts the PostgreSQL database system into a spatial database. It has been created by Refractions Research as a spatial database technology research project and published under a GNU licence. [2]

A spatial database stores and handles spatial objects like any other object in the database: this is what makes a database spatial. There are three factors that allow spatial objects to exist in native form in a database: the types of spatial data (it stores shapes such as points, lines and polygons in geometry columns), the spatial functions (used to consult the spatial properties and relationships) and the spatial indexes (which are used for the efficient processing of spatial operations).

With PostGIS we can use all the object types that appear in the Opengis specification (point, line, polygon, multipoint, multiline, multipolygon and geometric collections). Spatial data types may be simply understood as a binary representation of shapes in a row in a database.

3. Geoserver view



4. Geoserver WMS

5. Geoserver list of layers.

3. GEOSERVER

Geoserver is an open source software server written in Java that allows users to share and edit geospatial data. Designed for interoperability, Geoserver publishes data from any spatial data source using open standards.

A web map server is a specialised subset of the web server model. Like a web server, the requests sent to the server are interpreted and responded to. The main differences between a web map server and a "standard" web server are as follows:

- The responses are not necessarily a document or a file (.html .zip or .mp3 type), but geographic data.
- The request is a little more specific than http://servidor/archivo.extension.

3.1. Protocols

GeoServer implements the standard open web protocols established by the Open Geospatial Consortium (OGC), a standards organisation. It acts as a high-performance server compatible with Web Map Service (WMS) certification, and in fact it is the reference implementation of the OGC standard, and also implements Web Feature Service (WFS) and Web Coverage Service (WCS) standards.

GeoServer is a specific implementation of a web mapping server, offering access to the data in a known set of formats and sources (files and databases) using specific protocols. In a way, GeoServer acts as an abstract layer. It allows methods based on standards to access the geospatial data, regardless of the source data type.

GeoServer is able to read from many different data sources, from files saved onto the local hard disk to external databases. Below is a list of the most common data formats supported by GeoServer. This list is in no way exhaustive:

Files:

- Shapefile
- GeoTIFF
- ArcGrid
- JPEG2000
- GDAL formats

Databases:

- PostGIS
- ArcSDE
- Oracle Spatial
- DB2
- SQL Server

6. Geonetwork SDIMED catalogue home page

7. Geonetwork SDIMED catalogue example of search

8. Geonetwork SDIMED catalogue example of metadata

4. METADATA CATALOGUE

The organisations responsible for producing geographic products (maps, MDT, orthophotos, GIS layers, etc.) should be responsible for the creation of the metadata associated with each one of their products. The producers of geographic information are those who will have access to the necessary information in order to complete each one of the metadata elements and, in turn, using the data with which they are associated, they can carry out the appropriate updates of metadata.

Editing tools are available for the creation of metadata that allow all the metadata associated with a product to be given content. These tools include: geonetwork, metad, catmdedit, servicecube, etc. With these tools metadata files are created, all of which are characterised by being in XML (eXtensible Markup Language), a language for information exchange via the internet, and which comply with the ISO/TS 19139:2007 standard for Geographic Information – Metadata – XML schema implementation, which defines the XML schema with which any metadata register must comply.

4.1. Metadata editor: CatMDEdit

CatMDEdit is an open source, multiplatform and multilingual software that facilitates the creation, handling and publication of metadata for geographic information. CatMDEdit concentrates on the creation of metadata for Geographic Information according to the ISO 19115:2003 standard "Geographic Information – Metadata" and the NEM "Núcleo Español de Metadatos" profile, although it also allows the creation of metadata under the "ISO 19115 Core" profile (minimum subset of metadata elements defined by ISO 19115), the profile of the INSPIRE Directive and the WISE (Water Information System for Europe) profile of the European Water Framework Directive (WFD).

This latest version of the tool also allows the creation of metadata registers for web services (WMS, WFS, etc), according to the set of obligatory elements established by the metadata regulations of INSPIRE and complying with ISO 19119. We can also use this tool if we need to create metadata to be catalogued according to the Dublin Core standard and to transform registers from Marc-21 to ISO 19115 format.

The following are examples of geographic information that can be catalogued with CatMDEdit:

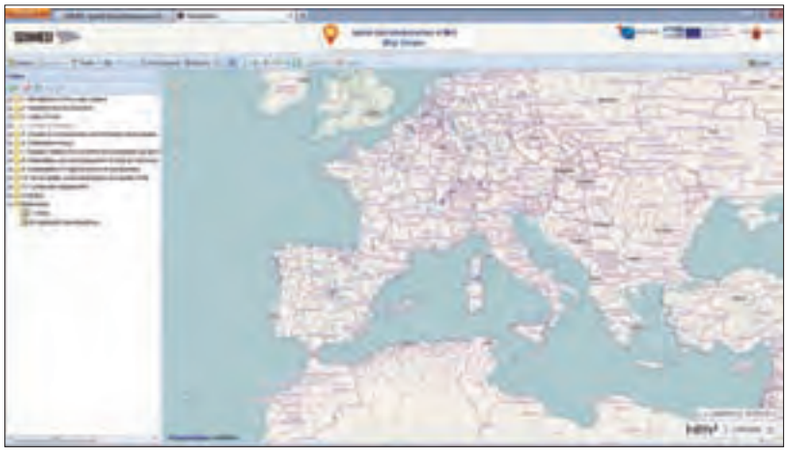
- Data: topographic maps on paper and digital media, layers of geographic information, spatial databases, orthophotographs, satellite images and digital models of land, etc.
- Services: web map services (WMS), web feature services (WFS), web coverage services (WCS), etc.
- Other resources: web pages, books, instalments, etc.

4.2. Catalogue service: Geonetwork

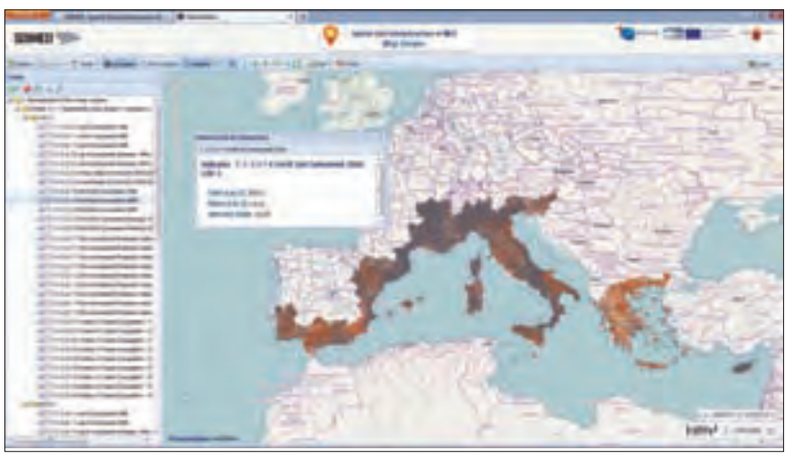
Once the metadata have been created they should be incorporated in a search and viewing system. The way to make them public in a clear and ordered manner is via Catalogues.

A catalogue is a web application that is used to integrate, distribute and disseminate the information on spatial data and services via metadata files. A catalogue is a fundamental pillar of a Spatial Data Infrastructure because it allows users to search and discover the documented resources (data sets, web services, etc.).

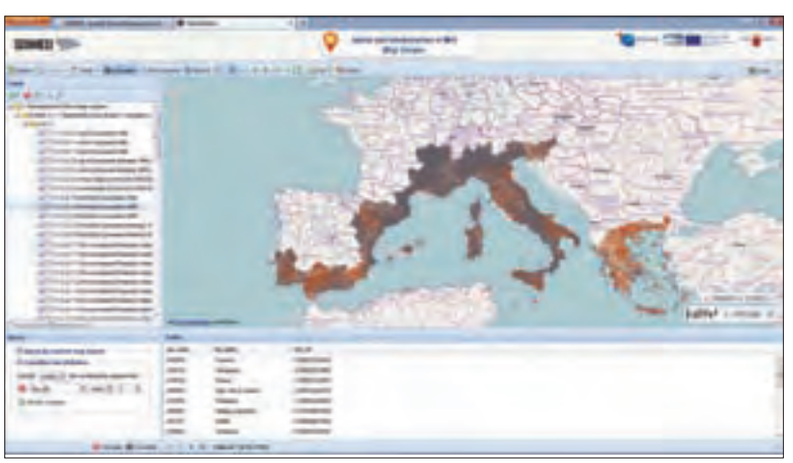
Another very important aspect in an SDI is the accessibility of the metadata, regardless of where they are located. We refer to the concept of distribution. When an organisation has a distributed catalogue, this means that it has implemented an OGC catalogue service for the web (CSW) to perform searches of other catalogues, so that a user performs searches on a single catalogue but this is connected technologically with other organisations and, therefore, information is being returned from various organisations. An example of a tool to create a CSW service is Geonetwork, which is the one selected for this project.



9 SDIMED Viewer home page



10. SDIMED Viewer layer list and info dialog



11. SDIMED Viewer Query dialog

5. VIEWER

Map applications contain layers of geographic information (raster or vector, from a wide variety of sources) and the controls for operating on these layers. These applications, known as map viewers, allow us, among other actions, to create interactive maps, view spatial/geographic information, include and superimpose different types of layers, edit information, etc. in a simple and user-friendly way and with the simple use of a web browser, without the need to know and handle the underlying technology that we have detailed in the previous sections.

To construct a viewer, one of the visible parts of an SDI, a variety of technologies is currently available on the market. For this project, it is proposed to use a combination of JavaScript libraries that allow us, via the appropriate configuration, to show all the spatial information generated in the project. Three libraries have been used: OpenLayers, ExtJS, GeoExt and GXP.

OpenLayers is a Framework GIS developed in JavaScript to build dynamic web map applications. Created in 2005 by Metacarta, OpenLayers is an OSGeo (Open Source Geospatial Foundation) project, distributed under a BSD licence. It allows us to interact with external GIS services (OpenStreetMap, Bing maps, Google Maps or any other maps hosted by local, autonomous community, national or European services) via map servers (MapServer, Geoserver, ArcGIS Server, etc.).

Ext JS is a JavaScript library that offers an extraordinary set of components (widgets) to include in a web application such as grids, data trees, menus and panels.

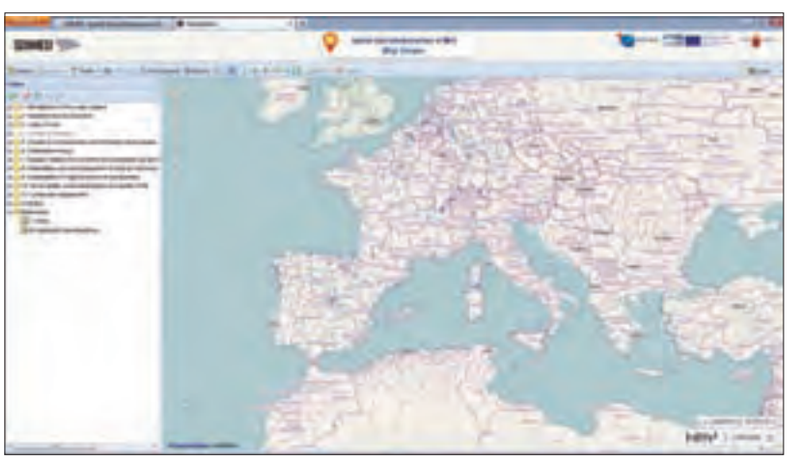
GeoExt combines the geospatial controls of OpenLayers with the user interface components of Ext JS in a framework that allows us to build GIS applications of a similar style to those of the desktop, but in a browser.

Lastly, use is made of Geoexplorer and GXP, a set of high level components for applications based in GeoExt.

The final result will be a web application with an appearance similar to this. Although the metadata catalogue that we spoke about in the previous section is a web application for searching and querying geographic information, with

links to the different viewers where this information is shown, on most occasions users use the viewers as the main source of information, ignoring the catalogue services as a query source.

For this reason the option to consult the metadata associated with each layer of information in the viewer itself has been enabled. For each layer loaded, the information (metadata) of that layer is available. But it is possible to go even further. If the functionality is added of embedding the search of the associated catalogue in the viewer itself, we can not only perform searches without needing to go to the catalogue, but also load the layers in the same process.



12. SDIMED Viewer Metadata explorer

OTREMED Indicators

The geometry of the OTREMED indicators shown in SDIMED comes from Euroboundary. EuroBoundaryMap provides a European geographic database for administrative and statistical regions, and provides harmonised access conditions for this geographic information within the framework of EuroGeographics. EuroBoundaryMap (1:100 000) offers the combined strength of detailed European administrative units and links to the corresponding LAU and NUTS codes.

The EuroBoundaryMap data is comprised of geographical coordinates, degrees (longitude, latitude) with decimal fraction. The spatial reference system is ETRS89 (WGS84) with ellipsoid GRS80. The difference between the ETRS89 and WGS84 coordinate systems is negligible. ETRS89 is defined for the Eurasian Plate. Although EBM contains data outside this plate, the probable deviations are not of importance for the EBM reference scale 1:100 000.

EuroBoundaryMap is provided without a specific map projection. It is recommended to apply one of the European map projections proposed by INSPIRE (Lambert Azimuthal Equal Area projection or Lambert Conformal Conic projection) should this be required. In our case we have worked in Lambert Azimuthal Equal Area projection.

For the graphic representation of the data in maps a technique called choropleth was used. This technique is used to represent quantitative data associated with areas (usually administrative, as in this case), and these data must always be relative data.

LAND CONSUMPTION INDICATORS

A family of land consumption indicators has been defined, based on common European mapping Corine Land Cover (hereinafter CLC) and codified with 1.1-3.2 code in the SDIMED viewer since they come from a mix between the OTREMED indicators 1.1 Residential Urban Areas and 3.2 Changes in Rural Land.

The CORINE (Coordination of Information on the Environment) Land Cover project provides a database on land cover and land use, presented as a cartographic product. The CLC project has been implemented in most of the EU countries, as well as in Central and Eastern European countries (38 countries with a total area of 5.8 M km2 participate in CLC: 32 EEA member countries and 6 collaborating countries). Therefore, it is a complete database for OTREMED Land Consumption.

CLC characteristics of scale (1:100.000), minimum mapping unit (25 hectares) and minimum width of linear elements (100 metres) have to be taken into account, that is surfaces smaller than the minimum mapping unit (25 hectares) and the minimum width of linear elements (100 metres) are not represented, so that the smallest urban fabric or other artificial land use polygons and the smallest agricultural areas are not presented in this analysis.

The first family of indicators includes the amount of land consumption, classified by type. These indicators have been obtained for the years of CLC campaigns so it will allow an analysis to be made of the evolution in the years 1990, 2000 and 2006.

Within this first family the following indicators are defined:

- 1.1-3.2/1 Land Consumption
- 1.1-3.2/2 Intensity of Land Consumption
- 1.1-3.2/3 Average annual growth rate
- 1.1-3.2/4 Fertile Soil Consumption
- 1.1-3.2/5 Intensity of Fertile Soil Consumption
- 1.1-3.2/6 Land consumed per capita
- 1.1-3.2/7 Environmental Protection Index
- 1.1-3.2/8 Urban and Residential Influence Area
- 1.1-3.2/9 Index of Coast Occupation

All of these indicators are calculated based on a reference area. This area will be NUTS3 and LAU2 measured surfaces.

The INSPIRE theme Coordinate Reference Systems (CRS) (D2.8.I.1 INSPIRE Specification on Coordinate Reference Systems – Guidelines: http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_Specification_CRS_v3.0.pdf) provides a harmonised specification for uniquely referencing spatial information. It also provides the specification for the map projection to be used for geo-referencing the spatial information in plane coordinates. So, for the horizontal component, INSPIRE requires the use of the European Terrestrial Reference System 1989 (ETRS89) for the geographical scope of ETRS89 and the Lambert Azimuthal Equal Area (hereinafter ETRES89-LAEA) is recommended for spatial analysis and display. Therefore, we have used ETRES89-LAEA for our spatial analysis.

1.1-3.2 / 1 Land consuption

This index is calculated as follows:

$$LC\ \% = \left(\frac{Consumed\ Land}{Reference\ Area} \right) \times 100$$

where:

Consumed Land (Built-up Area) = Km^2 occupied by buildings and infrastructures (CLC class 1)

Reference Area = Km^2 of LAU2-OTREMED or NUTS3 divisions.

For calculating urban and industrial areas a selection has been made of the CLC polygon layer corresponding to Level 1, Artificial surfaces.

This index reflects the percentage of land consumed by artificial areas within a given reference area for each particular year of CLC campaign.

The reference areas are LAU2-OTREMED and NUTS3 divisions.

Please consult the CLC nomenclature attached in this cd publication for more information about CLC classes and subclasses used in the calculation of indicators.

CALCULATION

1.CLC 2000 SLOVENIA
We started with CLC data-and-maps from SLOVENIA.

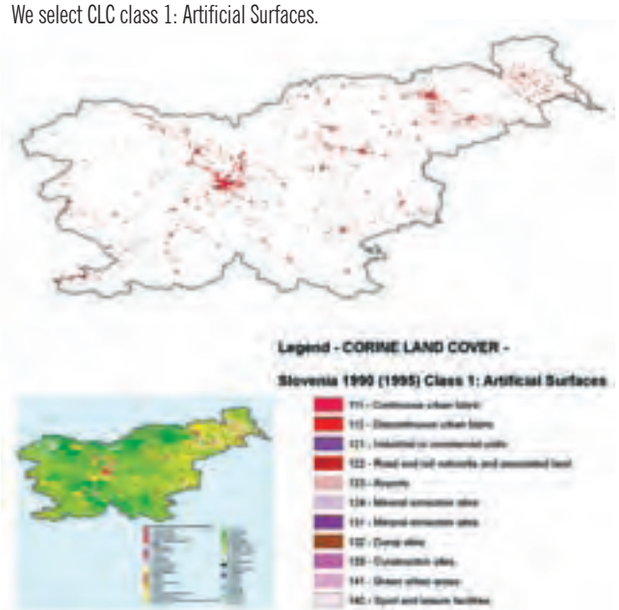
First Corine Land Cover campaing 1990 (1995) in Slovenia (Slovenia joined CLC project in 1995)

2.SLOVENIA LAU2 and NUTS3 divisions:

NUTS 3 units in Slovenia in 2012

LAU 2 units in Slovenia in 2012

3.Select CLC features.
We select CLC class 1: Artificial Surfaces.



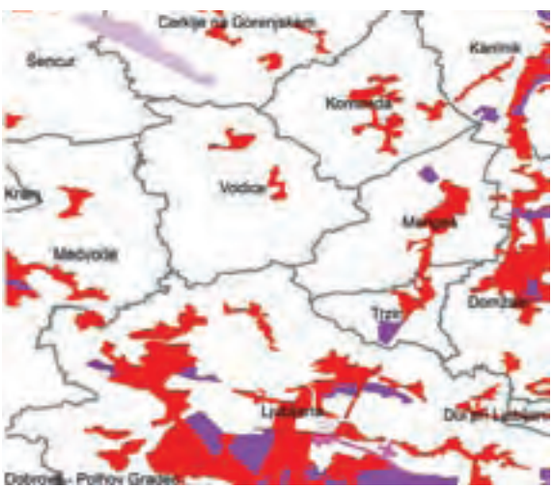
Artificial Surfaces in Slovenia from CLC 1990 (1995)

Artificial Surfaces in Slovenia from CLC 1990 (1995) in each LAU 2 units

Artificial Surfaces in Slovenia from CLC 1990 (1995) in each NUTS 3 units

1.Working with CLC features.

Dissolve the different subclasses to obtain a single polygon. Intersect these polygons with administrative boundaries (LAU2 or NUTS3) to create a polygon for each reference area (LAU2 or NUTS3 divisions).



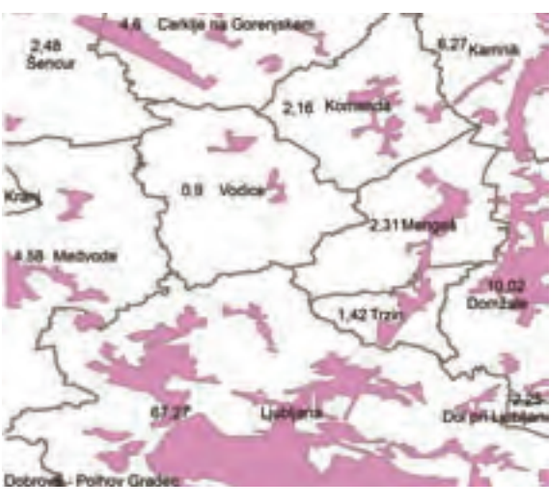
Artificial Surfaces polygons clasified by Corine Land Cover nomenclature level 3

Artificial Surfaces transform into a single polygon in order to calculate its area

2.Calculating areas.

We calculate the reference area (LAU2 or NUTS3) and CLC polygon area.

Calculated area of LAU 2 units

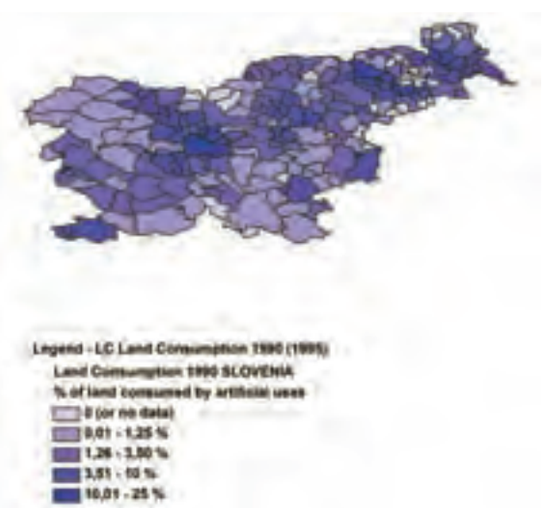


Calculated area of Artificial Surfaces polygons in each LAU 2 units

3.Calculating the index.

We apply the formula to obtain index values and a choropleth technique has been used for the graphic representation. All the other indexes are calculated in a similar way. However, each index uses a specific CLC class (or a mix of them) and a specific reference area.

Calculated Land Consumed index in each LAU 2 units



Calculated index LC 1990 (1995) at LAU2 level in Slovenia

1.1-3.2 / 2 Land consumption intensity

This indicator shows land consumption intensity taking into account the time factor.
It represents the land consumed in time intervals, considering the relationship existing between artificial areas (1990-2000, 2000-2006).
The calculation of this index was made by subtracting the Land Consumption rates previously obtained.

$$LCI = Consumed\ Land_{2} - Consumed\ Land_{1}$$

1.1-3.2 / 3 Average annual growth rate

This index determines the average annual growth rate in a given time interval.
The index is calculated as follows:

$$ARG\ \% = 100 \times \left[\frac{\left(LC_{2} - LC_{1} \right)}{\left(a \times LC_{1} \right)} \right]$$

where:

ARG: average annual rate of increase.
LC2: land consumed in subsequent years.
LC1: land consumed in the previous year.
a: Time interval in years

1.1-3.2 / 4 Consumed land per capita

This index shows the evolution of land use taking into account the population of each reference unit (LAU 2 or NUTS3). In all indexes we are working with Km^2 as the unit area, but at this rate we will use m^2.

$$SCpC = \left(\frac{ConsumedLand_{year}\, m^2}{Inhabitantnumber_{year}} \right)$$

Where:

Consumed Land: Km2 occupied by buildings and infrastructures (CLC class 1)
Reference Area = Km2 of LAU2-OTREMED or NUTS3 divisions

The index is calculated by dividing the land consumed in a given year by the number of inhabitants of that year. Population data were obtained from national statistical institutes.

1.1-3.2 / 5 Fertile soil consumption

The rate of consumption of fertile soil was calculated as follows:

$$FSC\ \% = \left(\frac{Agricultural\ Land}{Reference\ Area} \right) \times 100$$

Where:

Agricultural Land: Km^2 occupied by agricultural land (CLC class 2)
Reference Area = Km^2 of LAU2-OTREMED or NUTS3 divisions

To calculate the total area of agricultural land all polygons of CLC in Class 2, Agricultural Areas, have been taken into consideration. The reference areas are LAU2-OTREMED and NUTS3 divisions.

1.1-3.2 / 6 Intensity of fertile soil con

This indicator shows fertile soil consumption taking into account the time factor, so that agricultural soil consumed is assessed in a given time interval.

$$IFSC = Fertile\ Soil\ Consumption_{2} - Fertile\ Soil\ Consumption_{1}$$

It represents the fertile soil that is consumed at time intervals, considering the previous existing fertile soil (1990-2000, 2000-2006).
It has been calculated by subtracting consumption from the previously obtained index of fertile soil consumption.

1.1-3.2 / 7 Environmental protection index

The index has been calculated based on the km^2 of consumed land in a protected area and referring to LAU2-OTREMED and NUTS3 divisions.

$$EPI\ \% = \frac{Consumed\ Land}{Reference\ Area} \times 100$$

Where:

Consumed Land: Km^2 occupied by artificial areas and/or agricultural areas (CLC class 1 and CLC class 2)
Reference Area = Km^2 area of LICs and SPAs within LAU2-OTREMED or NUTS3 divisions

This indicator defines land consumption within European Environmental protection areas (SPAs and LICS) for each reference area. In this case the reference area is considered to be the area occupied by LICs and / or SPAs for each NUTS3 or LAU2-OTREMED division.

Information about LICs and SPAs comes from European Environmental Agency (EEA) data and maps, updated on 18 April 2012: http://www.eea.europa.eu/data-and-maps/data/natura-2000

This index is calculated for:

- Occupation by artificial areas (urban fabric and other artificial areas) which is used for the entire Class 1 of CLC mentioned above.
- Occupation by agricultural land, which is selected for all the polygons of class 2.
- Occupation by both artificial and agricultural areas where polygons selected are artificial areas (Class 1) and polygons of agricultural areas (Class 2).

As a result we have three different rates:

- 1.1-3.2/7 EPI_1: This indicator shows the percentage of land occupied by artificial surfaces within European Environmental protection areas (SPAs and LICS) for each reference area within the LAU2-OTREMED or NUTS3 divisions.
- 1.1-3.2/7 EPI_2: This indicator shows the percentage of land occupied by agricultural surfaces within European Environmental protection areas (SPAs and LICS) for each reference area within the LAU2-OTREMED or NUTS3 divisions.
- 1.1-3.2/7 EPI_t: This indicator shows the percentage of land occupied by artificial and agricultural surfaces within European Environmental protection areas (SPAs and LICS) for each reference area within the LAU2-OTREMED or NUTS3 divisions.

In this case the reference area is considered to be the area occupied by LICs and SPAs in LAU2-OTREMED divisions.

1.1-3.2 / 8 Index of influence of urban and residential areas

By calculating this index we will obtain the transition zone between urban and rural areas.

We selected the CLC polygons belonging to Class 1 artificial areas, particularly those belonging to the subclass 1.1. Urban fabric:

Once selected, classification of urban areas is based on the number of inhabitants. We will have three types of municipalities:

	INHABITANTS		
	X>20,000	20,000>X>50,000	X<50,000
Buffer	20 m	30 m	50 m

According to the above classification we obtain the area of influence of these areas by calculating the buffer and measuring the surface of that buffer.

This index is not still on the viewer since we do not have all the population data from our partner.

1.1-3.2 / 9 Index of coast occupation

This index is calculated as follows:

$$ICO\ \% = \left(\frac{Occupied\ Area}{Reference\ Area\ 500\,m\ coast} \right) \times 100$$

where:

Occupied Area: Km^2 occupied by artificial areas and/or agricultural areas (CLC class 1 and CLC class 2)

Reference Area 500m coast = Km2 of LAU2-OTREMED or NUTS3 divisions within a 500 metre buffer.

This index is calculated for:

- Occupation by artificial areas, Class 1 of CLC.
- Occupation by agricultural areas, Class 2 of CLC.
- Total occupancy of the coast where both polygons are selected: artificial area (Class 1) and agricultural area (Class 2) polygons.

As a result we have three different rates:

- 1.1-3.2/9_1: This indicator shows the percentage of land occupied by artificial surfaces within the first 500m of coast for each reference area.
- 1.1-3.2/9_2: This indicator shows the percentage of land occupied by agricultural surfaces within the first 500m of coast for each reference area.
- 1.1-3.2/9_t: This indicator shows the percentage of land occupied by both artificial and agricultural surfaces within the first 500m of coast for the reference area.

The reference area for this index is the area involving the first 500 m of coastline for each LAU2-OTREMED or NUTS3 division.

OTHER INDICATORS

These indicators are the other indicators from the OTREMED project.
This is a very diverse set of indicators and therefore the data sources are also diverse. However all of these data sources are official data sources from each country taking part as OTREMED partners. All these data sources and data characteristics are detailed in metadata.

An example:
In "1.2 Index of turnover of the potentially active population. Year 1990" data from Spain come from the "Instituto Nacional de Estadística" (INE: http://www.ine.es), the Spanish national statistics agency. Data from Italy come from the "Istituto nazionale di statistica", the Italian national statistics agency (ISTAT: http://www.istat.it). On the ISTAT website it is possible to find data, from municipal registry offices, for all Italian municipalities starting from the year 1981 until 2012.

Bibliografy

Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE).

D2.8.I.1 INSPIRE Specification on Coordinate Reference Systems – Guidelines http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_Specification_CRS_v3.0.pdf

Conclusion

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OTREMED, the territorial observatory of the mediterranean regions

To further integration in Europe, MED space has to meet a series of competitiveness challenges to promote territorial cohesion that was established as a goal in the Treaty of Lisbon. Accurate territorial information is needed to make decisions on the different territorial policies and this can only be achieved by gathering together a considerable amount of diverse but related data about the different regions in question.

Moreover, the information about the different Mediterranean regions, about the territory as a whole and about the determining factors associated with territorial cohesion, has to be compared to make certain decisions that require strategies on the competitive challenges and this involves the development of learning methods based on the experience of other regions.

This information is not clear or consistent at the moment, which is why there is a need for a tool that can pool together data about different regions, so that it can then be standardized. The main objective of OTREMED is to create this tool.

OTREMED is a European project that is part of the MED programme. Its objective is to provide the regions of the European Mediterranean with a tool that can develop their territorial competitiveness strategies so that they can join other regions of the European Union which are more developed.

OTREMED aims at promoting the principles of territorial cohesion established in the Treaty of Lisbon, by basing itself on the main objectives of the European Territorial Strategy.

OTREMED advocates the fundamental principles of spatial planning which, as we all know, not only has a passive role in planning the use of land and protecting the territory, but also has more of a proactive role in identifying the opportunity challenges for a particular geographical area, which favour a higher level of involvement in regional development, pursuant to the principles of sustainability. A strategy that is associated with a more rational use of the land, a balanced consumption of energy resources and more respect for nature, cultural heritage and the environment.

To this end, OTREMED is based on having in-depth knowledge of the Mediterranean traits and distinguishing features, which differentiate it as being a unique space, one that can be recognised by its particular climate, its history and culture, by its ecosystems, its travelling and entrepreneurial tradition, its migration flows and the potential of its resources, etc.

The objective of the OTREMED project is to create a tool that can be used as the basis on which an Online Territorial Observatory of the Euro-Mediterranean can be established. This tool materializes as a type of spatial data infrastructure: SDIMED, which can obtain homogenous information about the 48 regions that make up the Euro-Mediterranean space by means of territorial-related indicators.

The creation of this Observatory is based on a series of fundamental principles:

- The information is shared from the network nodes, generators and data consumers, and it involves applying the principle of subsidiarity; the data is made available to those that need it by whoever has it or generates it.
- SDIMED is based on free software so that there are no obstacles whatsoever when it comes to developing Nodes by means of their own IDE. It is an open, shared system in which the community (regions, municipalities, communes, etc.) supplies data and indicators (content generators).
- Sharing information requires standardization (INSPIRE Directive) and knowledge of the territory has to be acquired to carry out the comparative analysis, which is all aimed at attaining the established objectives.
- Consequently, a series of indicators that are based on the territorial nature of the MED space have been developed, so that the different facts about the territory can be assessed with homogenous criteria.

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