

# C Scientific report

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Following to EUROISLANDS' Specifications the stakeholders expect to receive from the Target analysis<sup>1</sup>:

1. an in depth knowledge of islands' situation;
2. a field analysis of 4-6 cases studies of different types of European islands;
3. an evaluation of their divergence from the European average;
4. an analysis of the islands' future potential from a European perspective;
5. a general evaluation of existing policy measures for the islands;
6. an analysis on policy options that can be adopted;
7. an integrated system for monitoring islands' evolution
8. a main reference work which could be used as basis for possible follow up studies.

In order to address the project's specifications the TPG has structured the actual work in five parts:

- 1. Rational and context of the study**
- 2. Methodology**, where are presented the methods used in the different parts of the project
- 3. Diagnosis, Trends and Findings**, comprising the Atlas of the Islands presenting their sustainability state (3.1) and the Islands' Attractiveness (3.2), the SWOT Analysis, the islands' potential (3.3), and the typology of islands (3.4)
- 4. Policy analysis and recommendations**, comprising the evaluation of the most important for the islands EU policies (4.1) and policy recommendation (4.2)
- 5. Integrated System for Monitoring Islands**
- 6. Issues for further analytical work and research, data gaps to overcome**

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<sup>1</sup> Specification of ESPON Target analysis based on User Demand 2013/2/2, The development of the Islands - European Islands and Cohesion Policy (EUROISLANDS) p.16

# 1. Rationale and context of the Study

## The scope

According to project's specifications "The aim of the EUROISLANDS target analysis is to deliver an appropriate reference work and a set of policy recommendations and strategic guidance to foster the sustainable development of the European islands within the framework of the Single Market, ensuring equal terms and opportunities with other non-handicapped regions".

## **1.1. Territorial cohesion and sustainability: the overall goal**

"Territorial cohesion is about ensuring the harmonious development of all the European places and about making sure that their citizens are able to make the most of inherent features of these territories. As such, it is a means of transforming diversity into an asset that contributes to the sustainable development of the entire EU", was communicated from European Commission to the other European Institutions (EU, Turning territorial diversity into strength, 2008, p.3).

European Commission also underlines that "many of the problems faced by territories cut across sectors and effective solutions require an integrated approach and cooperation between the various authorities and stakeholders involved. In this respect, **the concept of territorial cohesion builds bridges between economic effectiveness, social cohesion and ecological balance, putting sustainable development at the heart of the policy design**".

The concept of a territorial dimension within the European Union is hardly a novel idea. After all, the various structural policies that have been issued over the years by the European Regional Development Fund (ERDF), the European Social Fund (ESF) and other agencies have aimed, at least in part, to rectify regional imbalances and reduce core-periphery disparities. However, the traditional thinking of dealing with such issues through the twin aims of social and economic cohesion simply did not go far enough. **Most importantly, the top-down sector-specific policies and programs that were issued within the framework of the search for economic and social cohesion were often contradictory, reflecting minimal coordination between the various agencies responsible for these actions.** This meant that all too often, in the past, the attainment of balanced forms of development within various regions throughout the European Union has remained an unattainable objective. Moreover, the dominant approach until now has been one that has implicitly treated the

issue of regional inequities as one between advantaged and disadvantaged places, failing to recognize that territorial diversity can actually be a key strength, one that can lead to 'sustainable development of the entire EU' as mentioned above. The underlying principle behind territorial cohesion is that all regions throughout the EU should improve their competitiveness and through this, enhance the quality of life of their citizens whilst ensuring that environmental (natural and human built) resources are not compromised.

EU has already accepted that *"The concept of territorial cohesion extends beyond the notion of economic and social cohesion by both adding to this and reinforcing it. In policy terms, the objective is to help achieve a more balanced development by reducing existing disparities, preventing territorial imbalances and by making both sectoral policies which have a spatial impact and regional policy more coherent"* (CEC, 2004, p. 27).

What this could mean for regions with specific geographical features and particularly the islands? Answering this question is the main goal of the present study.

## ***1.2. Areas' attractiveness and territorial cohesion***

The settlement pattern of the European Union is unique (EU, Turning territorial diversity into strength, 2008, p.4) but uneven; it is even more intense concerning economic activities. Territorial cohesion asks for more "balanced development" as there is ascertained *"the excessive concentration of economic activity and population in the European "pentagon", the imbalance between the main metropolitan areas and the rest of the countries, the growing congestion and pollution and the persistence of social exclusion in the main conurbations, the presence of rural areas suffering from inadequate economic links and peripherality, the sprawling nature of urban growth, the accumulation of natural and geographical handicaps in outermost areas"* (ESPON, TIP TAP 2013 Project, Inception report, 2008 p.13).

But what can explain the actual spatial pattern that -it has to be underlined- is not stable but under perpetual change through the centuries following major socio-economic changes? What features do attract people and activities within some areas, mainly in the European pentagon?

The attractiveness of an area within the dominating development model has been based on economies of scale (increasing output), low transport costs (high accessibility) and agglomeration economies (positive external economies) in order to achieve low

production cost, necessary condition to be competitive. This means availability of human capital and natural resources, good transport infrastructure but mainly low distance from the production and consumption centres (urban agglomerations). These features have led by the cumulating effect to high concentrations and unbalanced development within the European territory concerning industry, decision making, administration, transport activities, knowledge, communication facilities, tourism, other services and population.

Is this pattern changing now?

According to the French Interministerial Delegation for Territorial Planning and Competitiveness (DIACT, <http://www.diact.gouv.fr/>), attractiveness has to be considered into its global context; taking into account economic, demographic, social, cultural and environmental aspects, attractiveness sets the question about the functions of a territory. DIACT considers that there are different factors contributing to a territory's attractiveness, which are not easy to rate.

These factors could be classified as:

- **Economic, technical and financial environment:** size of the market (final demand, size population, revenue), fiscal system, quality of industrial environment (agglomeration of activities), presence and quality of services for business, R&D environment, support mechanisms for enterprises.
- **Network of transport** (accessibility): organized and diversified.
- **Human resources:** diversification and quality of education and training system, labour availability, productivity and qualifications.
- **Quality of life:** Natural and urban environment, access to collective and private services, quality of services, security for people and goods.
- **Actors' organisation** (social capital): confidence, cooperation, dialogue among actors, quick implementation of common projects, social innovation.
- **Region's image:** image of the main urban centre, sectoral excellences, quality perception of natural and urban areas, valorisation of big projects concerning public equipment (energy, water, sewage, health etc) supply.

On the issue of attractiveness for population, *"most economists currently conceptualize human capital as a stock or endowment, which belongs to a place in the same way that a natural resource might. But the reality is that human capital is a flow, a highly mobile factor that can and does relocate. The key question then becomes: What factors shape this flow and determine the divergent levels of human capital across regions?"* (Mellander and Florida,

2007, p. 6). Wage levels, economic opportunities, university presence, land rent, quality-of-life amenities (consumer and personal service industries such as restaurants, theatres, and museums), the lifestyle (in the form of entertainment, nightlife, culture, and so on), production of artistic and cultural amenities, tolerance and openness to diversity, are considered to be the main parameters of attractiveness.

One of ESPON's recent findings is that "Low urban influence, low human intervention" areas had recorded rather good results on the European average during last period in most of socio-economic indicators (ESPON, Monitoring Territorial Development, p.43). Is it an indication that the way it is analysing the situation and the attractiveness of regions is changing and other parameters -as "quality of life"- but also socio-institutional parameters (social capital, governance) and features of the organisation of the local productive system (local networks), are becoming part of the attractiveness and competitiveness characteristics of territories?

*"Attractiveness and liveability of an area do not only depend on the hard and tangible factors such as infrastructure, human capital and risk of hazards. Soft location factors are of increasing importance for an area to attract both investments and also skilled labour. Soft factors like governance, culture and high quality urban and natural environment are important parts of regions' territorial potential and offer synergies for jobs and growth agenda"* (ESPON, Territory matters for competitiveness and cohesion, 2006, p. 7).

### ***1.3. Islands characteristics as permanent obstacles for attractiveness***

According to the Green Paper on Territorial Cohesion *"three specific types of region in some cases face particular development challenges: mountain regions .... island regions .... the 18 sparsely populated regions....."* (EU, Turning territorial diversity into strength, p.8).

**Islands characteristics as small size, remoteness and isolation are not compatible with the attractiveness principles of the dominating development model<sup>2</sup>.**

The concept of insularity is the connecting link, the common characteristic of all islands regardless of their size, population and development level. Insularity expresses 'objective' and measurable characteristics, including small areal size, isolation, as well as

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<sup>2</sup> The dominate mode of production is characterised of by a mass production of standardised goods located in or near urban centers; it's the main reason why the islands characteristics have frequently are labelled by the negative term "insularity" rather by the neutral "islandness" (see Annex IV).



unique natural and cultural environments. However, it also involves a distinctive 'experiential identity', which is a non-measurable quality expressing the various symbols that islands are connected to. More specifically, islands are spaces which are shaped by but also which shape the experiences of the people who live there, whether these are local inhabitants who have been there all their lives, returning islanders, visiting mainlanders, or retirees from other countries (see Lefevre 1991). Finally, within islands there is also a conceived or representational reality arising from their place in myth, folklore, literature, and history as places of escape, allure, paradise, refuge, but also incarceration. Thus, islands can be thought of as objects 'of the mind' as well as 'physical' objects.

Overall, "insularity" is composed of four characteristics:

- a. Small Size: More often than not, islands are small both in terms of areal size and population compared to mainland. Their small population results in a limited internal market and constrained local demand for commodities and services, as well as limited workforce. This, in its turn, limits scale and concentration economies. Concurrently, small size means that islands tend to have precious few -if any- land resources for extensive agriculture, whilst they also regularly lack key natural resources, including adequate water supplies, fossil fuels but also non-fuel minerals. In cases where raw materials may have been available earlier in history, these have now often been exhausted. The islands' small size has meant their environmental balance is regularly seriously endangered and this trait, in turn, makes environmental management a necessity.

In greater detail, the manner in which these characteristics negatively affect islands' attractiveness is described below:

- a.1. The limited variety and quantity of natural resources places constraints on the possibility of developing production activities, especially on a large scale. The scarcity of natural resources refers to a number of issues, including:
  - (a) The distribution of land uses, as the lack of space creates land use conflicts (e.g., between agriculture and tourist activities and/or second houses);
  - (b) The shortage of water, especially within the Mediterranean Basin, where chronic droughts combined with over-pumping of underground aquifers and wells have often resulted in severe - and in some instances irreversible degradation of resources. On many of the semi-arid islands of the Mediterranean, water shortages are further intensified given the proliferation of various

highly unsustainable practices (e.g., golf courses) and also because most tourists arrive during the dry season (summer).

Phenomena such as these can create adverse conditions for production, particularly within the primary, but also within the secondary sector.

- a.2. Small market: the existence of a small local (internal) market, dispersed over many tiny communities and isolated from neighboring markets, has meant the development of large-scale activities is rarely, if ever, viable. Moreover, because of globalization and wide-scale economic restructuring certain islands, which once had fairly dynamic sectors (e.g., shipbuilding – especially the construction of smaller vessels –, food processing, tanning, and textile manufacturing) have experienced severe marginalization as these activities have increasingly moved firstly to the European mainland and later on to low-cost regions and countries.

In the past, when transportation systems –based mainly on marine transport– were less advanced and organized quite differently, islands actually composed vital nodal points within regional transportation networks. Trade between neighbouring islands as well as between islands and nearby mainland territories was quite extensive. Unfortunately, today, markets have shifted towards mass and large-scale production and specialization within an increasingly liberated and competitive context. As a result, productivity on islands (especially smaller ones) is usually far lower compared to continental areas.

- a.3. Limited natural, economic and social carrying capacity: Island ecosystems are rarely able to support large-scale activities without experiencing severe adverse impacts on their societal, ecological, and economic environments. In previous periods when transportation possibilities were limited, local populations often adopted survival and self-sufficiency strategies with a multitude of small-scale activities for the local market keeping equilibrium. Specialization and intensification in order to achieve productivity and competitiveness in the global market combined with a limited carrying capacity significantly enhances the islands' vulnerability, a vulnerability which historically has been an important handicap due to the islands' tendency to depend on a narrow range of exporting activities (e.g., fishing, shipping, extraction and, nowadays, increasingly tourism). Dependency on a monoculture, such as the one that has resulted from

tourism on numerous islands, disrupts the economic or environmental balance of an area. Furthermore, such islands are exceedingly vulnerable to external factors, which can instantly lead to collapse of their narrow economy which relies on one dominant activity (e.g., the threat of war and terrorism to tourism).

b. Remoteness and isolation: These characteristics imply high installation and operating costs for companies, households and the state. These costs include:

- b1. Time costs: Almost all islands depend on public forms of transportation (e.g., ferry connections and air connections) and, as such, accessibility, to and from the islands, is constrained both by the frequency of connections but also the distance from European mainland areas and other islands. Links to metropolitan regions can often be extremely time-consuming and cumbersome. Additionally, on certain islands internal connections are poor, oftentimes because of their exceptionally rugged terrain. This means that in certain instances the only viable alternative for connections between two or more communities on the same island can be by sea, which again makes travel times long.
- b2. Money costs: All transported goods and services depend heavily on limited connections (both by sea and sometimes by air) normally dominated either by a single company or a narrow range of companies. The highly monopolistic or oligopolistic environment that characterizes transportation to and from the islands (and sometimes within islands) means that prices are often very high.
- b3. Infrastructure and operation costs of basic public services: Infrastructure and services have to be provided to each island separately, making them very expensive to install and operate. At the same time, the costs of providing administration services, education, health care, energy, internal transportation, communication, water supply, waste treatment, and so on can be exceedingly high on islands, especially when they lack sufficient population to make such services viable.
- b4. Costs relating to the absence of choices: On many islands the lack or shortage of adequate infrastructure and services combined with a small and fragmented market mean that inhabitants are burdened with additional expenses both in monetary but also temporal terms.

- b5. Access to information costs: Information -before the Internet era- used to have a very hierarchical pattern of diffusion. This meant that receiving all types of information on an island was difficult, not to mention it was subject to great delays and cost far more than in European mainland areas.

c. Special experiential identity: The particularities of insular space affect perceptions, behaviors and actions. As has already been mentioned, islands are 'objects of the mind' in addition to being physical objects and they are viewed in different ways by visitors – tourists and mainlanders – compared to long-term local inhabitants. While for the visitor, islands can be places to 'escape' from everyday life and live 'utopias', local inhabitants may have highly different views. For instance, they will be more aware of the hardships related to island life and, in some instances, at least some of them (especially younger people) may long for escape themselves if the chance arises. The relationship of islanders with the sea as mean of communication with the "other" world (new ideas, new products, innovations), but also as a danger for the life of their relatives working on sea (sailors, fisherman), but also for their life (pirates), has influence their character. Also, previous violent fluctuations in economic prosperity and migration fluxes have marked islanders' way of decision making. Understanding the state of mind of local inhabitants concerning the islands they live on is of paramount importance given that the context of this study involves a detailed understanding of the factors that determine their degree of attractiveness (see discussion Annex IV).

d. Particular, rich and vulnerable natural and cultural environment: Because of their small size and their isolation many islands have witnessed the evolution of unique endemic species and, as a result, have valuable terrestrial and marine ecosystems. Additionally, numerous islands have a rich historic past, which is presently highlighted through monuments, settlements and landscapes; many of these have been classified as national, European, or even world cultural heritage sites. This unique natural and cultural capital has for the moment being used mostly for the development of tourism - and in the case of the majority of Mediterranean islands mass tourism -. Ironically, in a number of cases, efforts to preserve such cultural and natural amenities have been considered by some local stakeholders to be an obstacle to economic growth. Indeed, there exists an increasing

tension on many islands between those who advocate the need to conserve these highly vulnerable resources and those who see these as the *only* realistic hope for generating economic well-being for the local inhabitants.

The aforementioned discussion has served to highlight some of the permanent physical and social features of islands in general and their disadvantaged state during the last decades within the global economic and social system that has, in turn, resulted in their economic, social, political and cultural marginalization. It is exceedingly obvious that the dominant development model, which sees the necessary ingredients of high population concentrations, specialization, large-scale production, and so on does not directly apply to most of the islands, especially the smaller and medium-sized ones. The extra costs, both direct and indirect, are also a permanent factor that burdens all actors of islands (companies, households and the public sector). Therefore, development options and policies, which are based on models of low production costs, cannot apply to most islands. Instead, other alternatives which rely of characteristics such as quality and diversification with the specific aim of targeting niche markets are far more preferable.

Having in mind the characteristics of insularity, we can support that activities on islands cannot:

- a) enjoy the privilege of economies of scale as islands have limited variety and quantity of resources;**
- b) have good accessibility and low transport cost, as islands are isolated and remote areas;**
- c) profit from agglomeration externalities<sup>3</sup> as islands have limited population and activities.**

The decrease of the strategic importance (economic, commercial, political) of islands during the 20<sup>th</sup> century resulted mainly from: (a) the change of production mode by the prevalence of the mass production and (b) the revolution in transportation system with the "revolution" in land (road and train) and air transportation that combined with the change in the size (and the technology) of ships, marginalised islands.

**So, islands territories cannot be competitive "vis a vis" the European mainland (and the worldwide economy) if they try to compete over the same products and services, as they**

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<sup>3</sup> These are traditionally considered as the advantages of urban areas and include localisation economies, activity-complex economies and urbanisation economies (ESPON 2010, p. 33)

**have to face a lot of extra costs. Islands cannot be attractive place for economic activities and habitation for the same parameters as the European mainland (and especially urban areas), as they have different characteristics.** For instance urban areas are characterised by big populations and good accessibility, islands are characterised by small size, remoteness and proximity to natural areas.

**At the same time islands are costly areas for the public sector which has to provide infrastructure (e.g. ports) and services (e.g. transport, health, education, administration etc) even for a very small number of inhabitants.**

On top of that, islands are generally characterised by low level of infrastructure and services offered to the enterprises and to the population. As part of the peripheral areas of Europe they are lagging behind the core areas concerning the Services of general economic interest as transport, communication, energy, research and development activities and other public services such as health care services, educational and lifelong learning services, water provision, etc. Consequently the attractiveness of the islands for enterprises becomes even lower.

Educated people (with university degree) are preferring large cities in their attempt to become a part of the knowledge economy; this fact is showing lower employment and career opportunities out of the big cities, fact that aggravates the capacity of the islands' economy for innovation, necessary step for the establishment of a competitive economy. The inadequate level of Services of General Economic Interest, of cultural infrastructures, activities etc, encountered by islands are making worse the level of attractiveness.

Even if the natural characteristics of islands restrict the gaining of a competitive advantage associated with production cost<sup>4</sup>, the situation is different with other factors related with the socio-economic lagging of most of the islands. **Islanders, as all European citizens, have to benefit of an equal access to networks and a more efficient and sustainable use of infrastructure and services coupled with the broadest possible dissemination of knowledge and innovation capacity.** Therefore, in order to ameliorate all those parameters conditioning attractiveness, important efforts have to be considered, giving priority to the "softer" ones.

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<sup>4</sup> Even if there is a generous policy to compensate the extra costs for islands, it will be extremely difficult to neutralize them.

#### ***1.4. Islands' policy in order to exploit islands characteristics***

The Green Paper on Territorial Cohesion (CEC, 2008), which launches a wide debate on Cohesion Policy, highlights as well the specific types of territories and regions. To better understand the strengths and weaknesses, which a specific region possesses, and to develop policies accordingly, there is a high demand for comparable and comprehensive evidence and knowledge from a European perspective for each type of region them. Against this backdrop, the Green Paper holds the respective subtitle "Turning territorial diversity into strength".

Apart from that, the Territorial Agenda of the EU (CEC, 2007) already underlined that diverse territorial potentials may form the basis for sustainable economic development. It states that "(...) *the diverse territorial potentials of regions for sustainable economic growth and job creation in the EU must be identified and mobilised. (...)*"

Territory is where processes take place. The challenge is that economic or social processes are not inevitably coupled to specific territories. Some territories favour specific activities, but in a globalised world the territory and its characteristic features do not play the role as in former centuries. Only if regions can transform them into specific territorial advantages and respond effectively and flexible to new demands they can withstand. (ESPON, 2007, p. 17).

This ESPON's research aimed to create a list of the island functions that can lead to general factors of success. Even if we apprehend the classical problems faced by islands, i.e. transport, tourism, energy, water... there are other ways of getting involved in island functions.

What can be said about the role that islands will play in a better distribution of population and activity over European territory? Is the European Pentagon the epitome of a sustainable EU, if one thinks in terms of quality of life, technologies of communication, transport congestion...?

The islands remain significant as depositories of both extensive cultural and biological diversity, and therefore platforms of differences in the context of an encroaching sameness exacerbated by globalisation. Is this function to be only at the service of a tourism approach?

Without going any further here, one clearly sees that the stakeholder's by these simple questions are having a vision for these island territories that requires an integrated policy. The territorial strategies that are implied by a global vision of "Islands" as a unique object of research and political action clearly require the

adoption of appropriate policies taking insularity as a whole concept.

So, the study has to analyse which of the islands' characteristics could be turned to comparative / competitive advantages and how:

- The small size, the remoteness and the isolation are characteristics prohibiting low cost production on islands; nevertheless traditional activities on islands use to have small scale, diversified, safe and high quality products. These (agricultural and manufactured) products, marginalised in the past, have now new markets and consumers ready to pay for better quality.
- The particular rich but vulnerable natural and cultural environment plus the unique experiential identity of islanders have to be exploited in order to offer a high level quality of life and opportunities for new (service) activities.

Development cannot be based only on existing activities and "recognised" resources. Development process is a dynamic one, revealing "new" resources, tangibles or intangibles that the local system has to identify and capitalize on them. **The challenge for insular space is to exploit the constantly changing global environment, and make use of the characteristics of insularity as advantages rather than disadvantages.** So, policies (both structural and sectoral) have to sustain this process.

In order to ameliorate islands' attractiveness and to support their comparative advantages, a better "*coordination between sectoral and territorial policies is important to maximise synergies and to avoid possible conflicts*" (EU, Turning Territorial Diversity into Strength, 2008, p.9). Amelioration of islands' accessibility to Services of General Economic Interest and other services connected with career opportunities and quality of life are necessary to improve attractiveness, which is very low in many cases. Structural interventions; adaptations in the first pillar of CAP, the employment strategy, the environmental policy, the improved access to high quality research, the differentiate regional aid for enterprises; the adaptation of competition and of fiscal policy; could be some of the measures of sectoral policies in order to sustain economic activity (EU, 2008, p.9-10).

**The basic assumption underlying the overall approach followed in this study is that areas which are no longer attractive for establishing competitive economic activities and attracting population will observe their socioeconomic base shrinking and will diverge from EU and national goals for sustainable development, economic, social and territorial cohesion.** Islands are considered among other areas as non



attractive places for permanent living and/or for business today. Can permanent factors due to insularity, external or internal socio-economic and environmental parameters, be blamed?

In order to achieve the envisaged results three questions will be answered:

- (a) what is the situation of Europe's islands within the context of sustainable development compared to the European mainland;
- (b) what are the causes of this situation and how insularity affects attractiveness; and
- (c) what policies would be appropriate for increasing the attractiveness of islands and addressing sustainability problems.

Within this framework the concepts of attractiveness and sustainability are integrated within a common context with policy implementation in the following way (Figure 1): the **analysis of the situation reveals the problems** that islands face in order to achieve sustainability goals; the **causes of the problems** are linked with internal and external factors influenced by their level of attractiveness<sup>5</sup>. Out of this analysis the need of **policy measures (inputs)** is brought forward in order to face attractiveness problems. Policy action has to create more and/or to ameliorate and/or to preserve and/or to improve the different forms of capital of an area (human, social, man-made -physical- and natural capital) as a precondition to achieve sustainability goals. The **policy outputs** have to address in short term the identified **attractiveness problems (results)** in order to achieve in medium and long term the **sustainable development goals (impacts)**.

An exemple could give a clear image to the above description:

1<sup>st</sup> step: a region is characterised by low economic activity measured by relatively low GDP, high unemployment and out migration

2<sup>nd</sup> step: the causes of the problem are identified as low accessibility (low accessibility index) and low productivity (low labor qualification, low R&D, low entrepreneurship), that means low attractiveness for new business.

3<sup>rd</sup> step: to address the low attractiveness the following policies have to be set up: new transport infrastructures (including mobile ones as trains and ships), specific training programs for entrepreneurs and employees, additional financing for R&D and eventually creation of new structures etc

4<sup>th</sup> step: check that the above policies are implemented in the right time and within the approved budget

5<sup>th</sup> step: check that the above policies have ameliorated the accessibility of the area, the skills of employees and entrepreneurs,

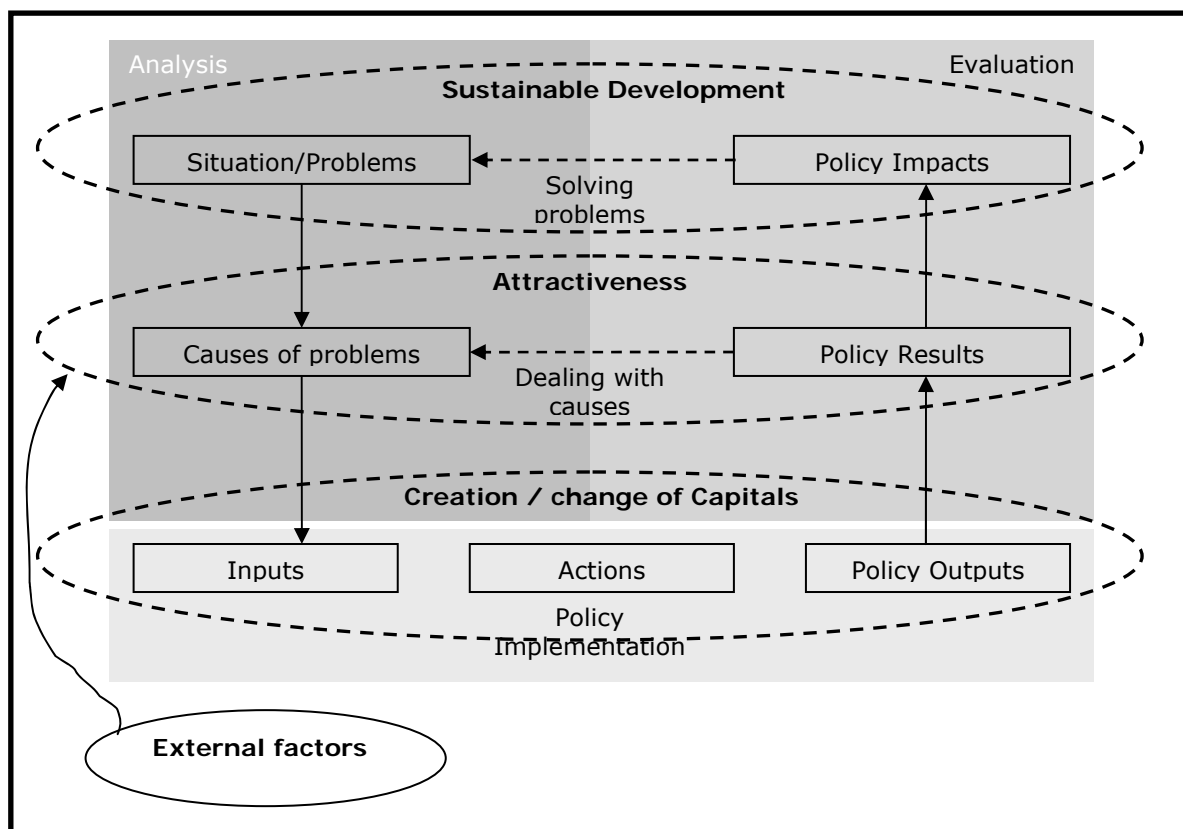
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<sup>5</sup> A review of bibliography on Insularity and Attractiveness is in Annex IV

the innovation level of the Universities and the enterprises, the number of new business etc

6<sup>th</sup> step: follow the evolution of the GDP, the unemployment, the structure of the population in the mid and long term.

Figure S1.1: Conceptual framework for analyzing islands



From the above analysis becomes clear what kind of information is needed in order to create a monitoring system. The necessary variables for the description of the state and of the attractiveness of an (insular) area are presented in the following chapter.

The analysis is based on information from: (a) 31 Island regions that are European statistical units (Member States, NUTS II or NUTS III) and (b) 9 case study islands, for which data is acquired with the use of local research and the assistance of local stakeholders. Additional information has been used from other European islands (not belonging in (a) and (b) groups above) in order to have a more complete image. So, all the different types of European islands are covered within this analysis.

The methods used follow this framework: different sets of indicators are developed for sustainable development and attractiveness, some of which require complex measurement approaches and

different data sets. More details are provided in the following section of the report.

A number of particularities and difficulties were met during the realization of this approach and these are linked with the nature of the territories examined and the type of information that is required.

Regarding the nature of the territories, although everyone knows what an island is, there are quite a few different definitions of islands in the Member States (with or without fixed link to the mainland, islands in lakes, with or without permanent population, regarding to the tide etc) and therefore different lists of islands; also the diversity of islands is significant, with many small or very small islands and some big or very big ones. Furthermore, since this is a study that refers to *islands* and not regions, the purpose was to have as much information as possible at **the individual island level**. This was a basic requirement as the study must reveal not only disparities between islands regions and Europe but also demonstrate key differences among islands themselves in the case of archipelagos (i.e Illas Balears, Notio Aigaio) and between islands and their regional mainland (intra regional disparities, i.e between Orkney, Western Isles, Shetland and the Region "Highlands and Islands"). Regarding the type of information required, the indicators used were selected by a variety of EU related projects concerning sustainable development and attractiveness and for many of them the use of readily available data is restricted to NUTS 0 or II levels, which are not compatible with the type of territories of this study.

The experience from previous studies<sup>6</sup> has proved that:

- Compilation of statistical data for all domains is practically impossible since a lot of information does not exist on the island level and when it does exist, it is impossible to be collected for all the islands within the short time constraints of a project (especially for the coastal islands that are not belonging to a island region).
- A focus on data collection, whilst a worthwhile exercise in some instances, can deprive the research team of the valuable time necessary for meeting the main objective of this study, namely the construction of the methodological and analytical framework. Therefore, the choice was from the beginning to consider this study as something more than a statistical exercise, even if quantitative data are always more

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<sup>6</sup> We refer mainly to 2 projects commanded by European Commission: "Planistat Europe & Bradley Dunbar Associates Ltd, 2003, Analyse des régions insulaires et des régions ultrapériphériques de l'UE," and «Ernst & Young, 1989, The socio-economic consequences of completing the internal market for the island regions of the European Community".

than welcome and the findings are based on the available data and the data that was generated by the research of the team.

- In this vein, qualitative information and results from previous studies, reports, work documents etc such as ESPON documents, Cohesion Policy reports, reports prepared by or for EU institutions and bodies like INSULEUR and CPMR's Island Commission, are extensively used,.

Data availability is addressed in various ways:

- Directly through available data that have been used already in previous ESPON studies and the ESPON databases for the 24 NUTS II and III island areas;
- Directly with available quantitative and qualitative data coming either from European Institutions and sources (the EC, Eurostat, the Corine database, the EEA), from national bodies (National Statistical Offices), from regional / local bodies and stakeholders, and from other sources (e.g., previous studies, reports, and international bodies)<sup>7</sup>;
- Indirectly using substitute (proxy) variables, especially for the environment, for which direct data are limited;
- Indirectly using qualitative methods and expert/local opinion;
- Directly through field research in selected case study areas.

Environmental information consist a particular problem within the project: although vital for the purposes of the study and the special features of islands (limited area, isolation, remoteness), the existing quantitative information is extremely limited even at the NUTS II level. The case studies have been used as a guide for more comprehensive information in the future for all islands.

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<sup>7</sup> In the main and the scientific reports the data come from Eurostat or other European Institutions or Bodies so that they are checked, harmonized and validated. National and regional data are used only in the case studies as complement when they are not contradictory with the data provided by the different european sources

## 2 Methodology

As already mentioned, the goal of the current report is to study European Islands in the EU socioeconomic and environmental development context. The basic assumption underlying the overall approach followed here is that areas which are no longer attractive for establishing competitive economic activities and attracting or retaining population will shrink their socioeconomic base and diverge from EU and national goals for sustainable development, economic, social and spatial cohesion. Such areas are islands, which are not very attractive places for living and/or for business today. External or internal socio-economic and environmental parameters can be blamed.

In order to respond to the three questions mentioned above, the concepts of attractiveness and sustainability are integrated within a common context for analyzing the situation and revealing problems (question 1); researching the causes that have led to this situation (question 2); and supporting the processes of planning and policy formulation (question 3).

In the following sections the methodologies for the different phases and types of research are presented in some detail. The different sections are as follows:

- **In the first section**, the planning for the primary and secondary research that was required to collect the data and the rest of the information is presented. This includes:
  - (i) The variables for the state and the attractiveness of islands and data collection strategies: (a) from existing data bases; (b) from stakeholders (of the project and from island stakeholders in general); (c) the local researches for the variables of the attractiveness of islands and data collection.
  - (ii) The construction of the three indexes for the typology of islands: the state index, the change index and the attractiveness index that was divided into three sub-indexes.
- **In the second section**, the methods for the Islands' Impact Assessment are presented, including the list of the policies included in the analysis and the correspondence of these policies with the case study islands.
- **In the third section**, the information system created to process the data and present them in maps and tables is presented.

The departure point of such a project is the definition of the territories and subsequently the territorial level of analysis. Even if islands are “naturally” better defined than mountains or border areas, national definitions differ significantly. For this project, we have initially used the definition of EUROSTAT (Portrait of Islands, 1994): an island is a territory surrounded by water: (1) inhabited by more than 50 permanent people; (2) not linked to the European mainland by a permanent device (bridge, tunnel, etc.); (3) distant by at least 1 Km from the European mainland; (4) with no capital of an EU member state. Finally we have retained the definition of island regions based on the criteria specified in Article 52 of the Structural Fund and Cohesion Fund Regulation and the criterion that excludes islands having a “fix link with the mainland” which concerns a growing number of coastal islands mainly in North Europe. Malta and Cyprus –two island states– are included, as well as islands with less than 1km distance from the mainland and islands with less than 50 inhabitants; even if their number is big they have not affected the analysis. Islands in inner waters are not considered in this study as well as ultra-peripheral islands.

Even though having an exhaustive list of islands was not a prerequisite of the study, an attempt to record them was undertaken. Based on previous investigations and information collected from different sources, 362 islands were listed with more than 50 inhabitants (see par. 2.1.3., Table S5) plus 228 very small islands with less than 50 inhabitants (Table S1).

In ESPON 2013 program, islands are listed as one of the specific types of territories that have to be studied in order to offer “comparative insight and understanding on territorial potentials and challenges from a European perspective and to ensure that other (similar) types of territories/regions can benefit from the output of the analysis”. **So the analysis is focused on demonstrating the common characteristics of islands in comparison with other European territories taking into account their territorial, administrative and other particularities.** For this reason, the project will address the “*islands’ question*” in two different but parallel levels:

- The first level is the horizontal analysis of all islands NUTS II and NUTS III regions, since comparable data are available for them. **This will provide a glimpse and will be compared with the European average** using already existing data (more details in the next section). This comparison is indispensable in order to document the necessity of a European island policy within territorial cohesion principles. More information was obtained from the stakeholders and ESPON national focal points to

address specific islands' features that have not been studied yet from previous ESPON's projects.

Table S1: Very small islands

No	NAME	SURFACE AREA (in Km <sup>2</sup> )	COUNTRY	No	NAME	SURFACE AREA (in Km <sup>2</sup> )	COUNTRY
1	BARSO	2,5	DK	115	EKHOLMEN	0,43	SE
2	BIRKHOLM	1	DK	116	GILLINGE	0,7	SE
3	BJORNO	1,5	DK	117	GRANHOLMEN	0,89	SE
4	BAAGO	6,23	DK	118	GRINDA	1,67	SE
5	HJORTO	0,9	DK	119	GÄLLNÖ	5,28	SE
6	NEKSELO	2,2	DK	120	HARÖ	2,76	SE
7	SKARO	2	DK	121	HJÄLMÖ	1,05	SE
8	KOINASTU	2,6	EST	122	IDÖBORG	0,07	SE
9	MANIJA	1,9	EST	123	JUNGFRUSKÄR	1,01	SE
10	KESSULAID	1,7	EST	124	KORSÖ	0,97	SE
11	ÆGNA	2,9	EST	125	LADHOLMEN	0,49	SE
12	NAISSAAR	18,6	EST	126	MÖRTÖ	1,87	SE
13	PAKRI	12	EST	127	N STAVSUDDA	0,49	SE
14	CHAUSEY	0,65	FR	128	NÄMDÖ	10,44	SE
15	KORONIS	0,235	GR	129	ORRÖN	1,3	SE
16	PLATEIA	1,575	GR	130	RISHOLMEN	0,16	SE
17	ALKIONIDES	0,911	GR	131	RUNÖ	0,28	SE
18	PRÖTI	3,107	GR	132	S LAGNÖ	1,07	SE
19	SAPIENTZA	9,018	GR	133	S STAVSUDDA	1,69	SE
20	SXIZA	12,13	GR	134	SAXAREN	0,42	SE
21	SKORPIOS	0,878	GR	135	ST TORNÖ	0,44	SE
22	ADELFOI	1,032	GR	136	STORÖ	2,74	SE
23	ALATAS	0,566	GR	137	SÖDERMÖJA	2,95	SE
24	KYRA PANAGIA	24,973	GR	138	TRANGHOLMEN	0,39	SE
25	PERISTERA	14,513	GR	139	TRÄSKÖ	0,86	SE
26	PIPERION	4,166	GR	140	UVÖN	1,92	SE
27	KOINIRA	0,356	GR	141	VANÖ	0,38	SE
28	GYALI	4,558	GR	142	VARHOLMA	0,79	SE
29	KALOLIMNOS	1,912	GR	143	VÄSTERÖ	0,66	SE
30	KINAROS	4,577	GR	144	EDHOLMA	0,57	SE
31	MARATHOS	0,355	GR	145	GRANHOLMEN	0,12	SE
32	LEVITHA	9,121	GR	146	HÄSTHOLMEN	0,58	SE
33	PLATI	0,205	GR	147	TISTELN	0,01	SE
34	RO	1,476	GR	148	Ö GRANHOLMEN	0,28	SE
35	SARIA	20,429	GR	149	BASTUHOLMEN	0,1	SE
36	STROGGILI	0,174	GR	150	ST SKRAGGEN	0,1	SE
37	DHLOS	3,536	GR	151	GASÖN	0,96	SE
38	KATO ANTIKERI	1,05	GR	152	KORSHOLMEN	0,05	SE
39	MAKRONISOS	18,427	GR	153	TEGELÖN	0,5	SE
40	AGIOS GEORGIOS	0,052	GR	154	DUVHOLMEN	0,04	SE
41	AGIOS MINAS	2,343	GR	155	FJÄRDERHOLMA RNA	0,07	SE
42	SAMIOPOULA	1,018	GR	156	ASPÖN	0,42	SE
43	CHRISI	4,743	GR	157	BJÖRKÖ	1,39	SE
44	GAUDOPOULA	2,813	GR	158	FIVERSÄTTAÖN	0,75	SE
45	DOKOS	13,537	GR	159	JUTHOLMEN	0,03	SE
46	STEPSOPOULA	1,956	GR	160	KYMMENDÖ	1,74	SE
47	TRIKERI	0,923	GR	161	LANGGARN	1,13	SE
48	INIS BO FINNE	2	IE	162	RANÖ	5,2	SE
49	INIS FRAOIGH	1,6	IE	163	STENHOLMEN	0,25	SE
50	AN TOILEAN RUA	0,65	IE	164	VITSGARN	2,66	SE
51	GABHLA	3,28	IE	165	ALÖ	5,4	SE
52	CONY	2	IE	166	ÄNGSHOLMARN	0,27	SE
53	DERNISH	2	IE	167	BEDARÖN	1,8	SE
54	INIS BIGIL		IE	168	BERGHOLMEN	0,21	SE
55	INISHCUTTLE	0,07	IE	169	DEGERHOLMEN	0,24	SE
56	INISHLYRE	<1	IE	170	KROKSKÄR	0,14	SE
57	CLYNISH	<1	IE	171	LANDSORT	1,64	SE
58	INISGORT	<1	IE	172	ASKÖ	6,31	SE
59	INISHNAKILLEW	<1	IE	173	HARTSÖN	3,29	SE
60	ISLANDMORE	<1	IE	174	LANGÖN	4,73	SE
61	CLAGGAN	<1	IE	175	RINGSÖN	7,48	SE
62	INIS TRA MHOR	2	IE	176	SÄVÖ	0,92	SE
63	HEIR	3,75	IE	177	ARKÖ	3,73	SE
64	LONG	3,84	IE	178	GRÄNSÖ	4,7	SE
65	WHIDDY	7,68	IE	179	HÄSTÖ	0,32	SE

No	NAME	SURFACE AREA (in Km²)	COUNTRY	No	NAME	SURFACE AREA (in Km²)	COUNTRY
66	DURSEY	9,9	IE	180	L RIMMÖ	0,74	SE
67	FALESON	0,63	SE	181	ASPOJA	1,74	SE
68	LANGOREN	1,66	SE	182	BIRKÖ	0,24	SE
69	HINDERSON	14,16	SE	183	KALLSÖ	1,16	SE
70	JUNKON	13,06	SE	184	KORSHOLMEN	0,1	SE
71	KALLAXON	3,8	SE	185	LAMMSKÄR	0,14	SE
72	KALKHOLMEN	0,62	SE	186	MISSJÖ	0,88	SE
73	LANGON	5,99	SE	187	ST RIMMÖ	1,38	SE
74	STORBRÄNDÖN	10,06	SE	188	TRÄNNÖ	0,98	SE
75	YTTERSTHOLMEN (pitea)	0,07	SE	189	VÄNSÖ	1,81	SE
76	LILL-SANDSKÄR	0,22	SE	190	ÄSPHOLM	1,07	SE
77	STOR-SANDSKÄR	0,68	SE	191	AXELSÖ	0,98	SE
78	MALMÖN	2,83	SE	192	BONDERKROK	1,13	SE
79	N ULVÖN	16,21	SE	193	GRÄSMARÖ	0,78	SE
80	LUNGÖN	9,31	SE	194	HARTSENA	1,78	SE
81	FÄLÖN	2,78	SE	195	HASKÖ	1,98	SE
82	LÄNSÖ	1,66	SE	196	KÄTTILÖ	1,36	SE
83	ORMÖN	3,03	SE	197	ST ALÖ-BOKÖ	6,59	SE
84	ST RISTEN	1,83	SE	198	BJÖRKÖ	2,86	SE
85	ASKOLMEN	0,42	SE	199	EKNÖ	10,46	SE
86	EDSGARN	1	SE	200	FLATHOLMEN	0,11	SE
87	FEJAN	0,79	SE	201	GÄRDSHOLMEN	0,24	SE
88	GRÄSKÖ	1,18	SE	202	HASSELÖ-SLADÖ	8,05	SE
89	HÖGMARSÖ	1,92	SE	203	ORONSAY	5,76	UK
90	KROKHOLMEN	0,37	SE	204	LUNGA	2,59	UK
91	L GRÄSKÖ	0,08	SE	205	SHUNA	4,98	UK
92	LÖPARÖ	1,94	SE	206	ERRAID	2,29	UK
93	NORRÖRA	2	SE	207	GOMETRA	4,9	UK
94	RÄKNÖ	0,76	SE	208	ULVA	18,88	UK
95	RÖRSKÄRET	0,34	SE	209	FLODDA	1,45	UK
96	SJÄLBOTTNA	1,61	SE	210	GRIMSAY	1,17	UK
97	ST ENSKÄR	0,15	SE	211	BALESHARE	10,15	UK
98	ST KLYPPINGEN	0,77	SE	212	INCHCOLM	85	UK
99	STOMNARÖ	1,07	SE	213	CANNA	157,35	UK
100	SUNDHOLMEN	0,59	SE	214	MUCK	5,41	UK
101	SV. HÖGARNA	0,56	SE	215	RHUM	108,26	UK
102	SÖDERÖRA	1,27	SE	216	SANDAY	2,03	UK
103	BETSÖ	0,55	SE	217	RONA	10,47	UK
104	HUSARÖ	1,58	SE	218	EILEAN BAN	0,1	UK
105	MJÖLKÖ	0,74	SE	219	SCALPAY	24,99	UK
106	ST JOLPAN	0,89	SE	220	SOAY	10,4	UK
107	ALÖN	0,46	SE	221	HOLY ISLAND	26,4	UK
108	ÄNGSHOLMEN	0,22	SE	222	GAIRSAY	2,57	UK
109	ÄPPLARÖ	1,08	SE	223	GRAEMSAY	3,93	UK
110	Ö LAGNÖ	4,49	SE	224	WYRE	2,78	UK
111	ÖRSÖ	1,21	SE	225	AUSKERRY	0,55	UK
112	BISKOPSÖN	0,76	SE	226	BRURAY	0,52	UK
113	BOHOLMEN	0,11	SE	227	PAPA STOUR	8,83	UK
114	BOSKAPSÖN	0,29	SE	228	VAILA	2,95	UK

- **The second level is the analysis at the island level - complementary to the horizontal one-, in order to provide more detailed information on islands.** Since data is available for a limited number of individual islands (state islands, NUTS II or NUTS III area islands) more data were collected from secondary sources, plus from field research for 6 islands initially and 9 in the end that were chosen for this purpose. These **case studies** were chosen to represent specific categories of European islands and especially smaller ones in order to complete the analysis of Stat are not covered by the first level of analysis at NUTS II or NUTS III level.

**The classification of islands, necessary for conceptualizing an island policy, was based on the analysis of these 31**



**islands' regions**, but when available and relevant, additional information was used. The analysis and the formulation of policy is assisted by a **monitoring system for islands** which aims "...to measure and to analyse spatial phenomena in order to interpret the living conditions of people, business conditions and to explain the differences with regard to an equivalent and balanced territorial development. This information is not only needed for the spatial structure, but also for elements that influence and change the spatial reality. Spatial monitoring must satisfy both the demands for an analytical base for sound spatial analysis and also for the varying political demands enabling the evaluation of policy strategies and the assessment of the achievement of policy aims. A policy-oriented spatial monitoring system needs the sound base of indicators to cover a detailed and profound demand for information arising from the need of interpreting different regional levels and also enabling a detailed thematic evidence base" (ESPON, Tentative Spatial Monitoring Report, 2006, p. 8).

"Continuous monitoring of spatial development, mostly based on the analysis of quantitative indicators, is a major tool for policy-makers to assess recent development trends, identify problems and communicate needs for action. Monitoring is also vital to be able to present the results of "successful policies" and to compare general policy values and concepts with actual states and perspectives of the territory" (ESPON, Tentative Spatial Monitoring Report, 2006, p.14).

To set up the monitoring system, 3 steps were followed:

- The **parameters** to be taken into account were described;
- The **variables** and **indicators** necessary to respond at expressed needs (***routine indicators*** and ***wish list indicators*** according to ESPON's definition) were identified,
- The **proxy variables** as substitutes of non-existent / non available variables were defined.

The quantitative and qualitative information required has to fulfil 3 principles:

- to be scientifically sound for responding to the submitted questions,
- to be based on existing data and indicators to facilitate collection and comparisons within EU,
- to be relevant for islands, taking into account insularity characteristics.

As the discussion in the next sections demonstrates, the different European Sources (ESPON, Eurostat, EEA) of data are generally

available for routine and proxy variables at State and NUTS II level, but not always at NUTS III level.

It has to be stressed here that a pertinent monitoring system for islands has to include:

An overview of the information system is presented in section 2.4.

## ***2.1. Planning for primary and secondary research required to collect data and information to answer the questions of the study***

### *2.1.1. Variables for the state of islands and data collection strategies*

The estimation of the sustainability of the islands results in the Islands' Atlas. This estimation is based on the use of sustainability indicators fleshing out the differences that separate islands from the EU -27 as well as the national entities. Specifically, it is important to monitor how the islands vary from the EU and national means in terms of measures of *economic efficiency, social justice and equity*, as well as *environmental conservation*.

Regarding the **efficiency of an area's economy**, it is necessary to record how effective and competitive it is today and to provide information about its perspectives. The parameters are used in order to evaluate the output (growth) of the productive system (economic effectiveness) and the development of the economy and its prospects in time (fragility).

The efficiency - competitiveness of an economy is measured by the evolution of the output (growth) of the productive system in question in units of GDP. The more competitive an economy is, the more products and services it produces. The following indicators are proposed to describe the situation and to allow comparisons between the different areas and through time; they are also necessary to show the relative position (divergence-convergence) of each examined area with the areas of reference (EU 27, member states):

- GDP per capita
- GDP per employee, which measures the productivity of the specific economy
- Change rate of GDP and GDP per capita

In the case where no data of GDP can be obtained (data of GDP generally are not available at level lower than NUTS III),

employment and the rate of change of employment are proposed as proxy variable-indicator.

With regards on showing the level of development of the economy and its prospects in time, qualitative information are considered as more suitable and the following parameters are proposed:

- Importance of competitive economic branches: economic activities with exports are considered as competitive, along with the ones that cover local needs which could be satisfied by imports. Both of these categories of activities are shrunk when they are no longer competitive. The primary sector, mining and manufacture, as well as tourism and services to enterprises are included in this case. Sectors such as construction, energy and other services (commerce, banking, transport, administration, education, health care, personal services, etc.) are placed among the non competitive economic activities as they have to be produced locally. The analysis is performed on the two digit statistical EUROSTAT codes. Technological developments (such as ICT) result on a shift of the localization of some services considered as "residential", contributing on the "shift" of the boundaries between competitive and non competitive branches (i.e e-commerce can substitute local retail in a growing number of products).
- Qualitative characteristics of the main branches: all branches do not contribute in the same way on the development of an area. Branches which produce products and services with increasing demand, low competitiveness and high added value (usually involving integration of advanced technological capital and employment of qualified human capital) have enhanced potential and more promising prospects. For example, the specialization of an area into agricultural production, into weaving/textile manufacturing or into mass tourism, is not the same as being specialized into computing and communications, biotechnology, organic products, or special interest sustainable tourism.
- Degree of dependence on main activity(ies)-monoculture: the dependence of a local economy on one or a very limited number of producing branches can not be considered as an evidence of economic stability, since it is relatively fragile and susceptible to changes/shifts or crisis. This refers especially to the dependence from "traditional" and declining branches, but could also be true for "modern" branches.
- Economic leakages: It refers to the part of GDP which leaks from an area as the revenue of "foreign" capital invested locally, as income/wages of persons/employees of non local residency, as imports of goods and services. It is generally accepted that economies which have relative low leakages are considered to be

“developed”, with the sense that there exist links between the different branches; i.e the inputs necessary for the tourism sector (equipment, food, beverages, publishing activities, marketing services etc) are present in the local market. Since the quantification of leakage (or the corresponding degree of coverage of needs/demands from the local production) through the estimation of the multiplying factor of imports, is a difficult task which requires the complete outline of each island economy separately, the particular parameter is approached either qualitatively, or is substituted by the “weight of competitive economic branches”. Information on the proprietors of the companies and the residence of employees can compliment the knowledge about leakages.

- Residential economy: it refers to the flux of revenues acquired out of the local production system (from abroad or from another region of the country) by certain residents. These economic agents are people that are living during a period in a place, but their revenues are not coming from a local activity, i.e. pensioners, commuters, tourists and second home owners.

**Social justice/equity** records the diffusion of the benefits arising from economic growth to the overall society; it is depicted in the structure and evolution of the population and in social cohesion. The main parameters used are:

- Population and population change (absolute change and growth rates, natural movement, replacement rate);
- Migration;
- Active population;
- Dependent population (>15 years old and <65 years old);
- Aged population (<65 years old).

The parameter “social cohesion” reveals the grade of diffusion of the benefits of economic development in the local society. The proposed parameters and variables/indicators are:

- Unemployment: total, female, young;
- Long term unemployment;
- Income per capita;
- Distribution of income;
- Life expectancy (as it reflects the quality of life and the quality of health system);
- Early school leavers.

The estimation of **environmental conservation** concerns the capacity of the natural capital to ensure the supply of environmental good and services to a specific society by taking into account the specific characteristics of the islands (relatively small land masses and isolation) that limit space and results in vulnerable ecosystems and more intense impacts from climate change.

Successful environmental management and policies will, and can be, the basis for the success or failure of the economy and the social system. Thus it is important that environmental conditions are monitored at the same time as those concerning human systems to ensure a better interaction between the two. With all these in mind the parameters considered are:

- *Availability and quality of water resources*: refers to the preservation of ecosystem services and functions that permits the supply of necessary (quantity) and appropriate (quality) water for different uses. The demand of modern societies increases and the result is that several regions across Europe face water scarcity. This affects more islands, where often over extraction of underground water resources takes place.
- *Coast and seas quality*: refers to the preservation of ecosystem services and functions provided by the marine-coastal and pelagic ecosystems (fishing, nutrient cycle, waste detoxification). The main threats to European coastal areas and seas are water pollution and eutrophication, loss of biological diversity, beach loss and landscape deterioration, coastal erosion, over fishing etc. Sewage discharge, industrial and domestic, agricultural fertilizers and ship transport are mainly responsible for the pollution of ground water, rivers, coastal and marine waters, affecting the biodiversity of thousand of habitats and harming human health. Frequent and severe deviations of sea surface temperature could herald shifts in currents, upwelling, weather patterns and climate, and could negatively affects the resilience to other hazards (e.g. for water movements, the spread of and ability of ecosystem to attenuate pollution). Increase of nutrients in transitional coastal and marine waters can result in a chain of undesirable effects, starting from excessive growth of plankton algae, which can increase the risk of local oxygen depletion and reduce biodiversity and nurseries for fish, changing coastal ecosystems. Over-fishing can also have serious consequences for the entire marine environment. Certain fishing techniques, such as trawling, cause damage to the highly important seabed habitat and fish stocks. At the other end of the food chain, seabirds, seals, whales and other marine mammals are affected directly. Also under the Bathing Water Directive (76/160/EEC) Member States are required to designate coastal and inland bathing waters and to monitor the quality of the water

throughout the bathing season to protect the public from accidental and chronic pollution incidents.

- *Biodiversity*: concerns the preservation of biodiversity and the habitats that sustain it. Biodiversity is the key to 'ecosystem services', i.e. the services that nature supplies: climate regulation, water and air quality, soil fertility, and the production of food, fuel, fiber and medicines. Quality of life, economic competitiveness, employment and security all rely on this natural capital. Biodiversity embraces the variety of genes, species and ecosystems that constitute life on Earth. We are currently witnessing a steady loss of biodiversity, with profound consequences for the natural world and for human well-being. The main causes are changes in natural habitats. These are due to intensive agricultural production systems, construction, quarrying, overexploitation of forests, oceans, rivers, lakes and soils, alien species invasions, pollution and — increasingly — global climate change. The coverage of protected area, such as the NATURA-2000 network of protected areas, provides a uni-dimensional indicator of political commitment to biodiversity conservation but it doesn't provide information on its effectiveness. The measurement of species diversity on the other hand provides a high-level generic indicator that will show the state and trends of biodiversity in a specific habitat, ecosystem etc. The more endemic and endangered species a natural habitat has, the more vulnerable it is because localized extinction cannot be re-supplied from elsewhere by natural or augmented recolonization and losses of key species can affect ecosystem function. Habitat fragmentation into discontinuous pieces (e.g. from transport infrastructure or urban sprawl), can put pressures on the ecosystems, and relates to habitat disturbance and degradation. The introduction and establishment of alien species into a habitat can result to severe impacts on biodiversity and ecosystem integrity, at the levels of populations, genetics, species and ecosystems through complex ecological interactions.
- *Land use/ quality & Landscape quality*: refers to the type of land cover and land use and to the degree of alteration of the landscape from elements such as infrastructures, buildings and other installations. Land cover and land use change rapidly today across Europe, leading to unprecedented changes in landscapes, ecosystems and the environment. Urban areas and related infrastructure are the fastest growing land consumers, mainly at the expense of productive agricultural land and/or forests. Rural landscapes are changing due to agriculture intensification, land abandonment and forest exploitation. The impacts can be direct, e.g. the destruction of natural habitats and landscapes, or indirect, e.g. soil-sealing and deforestation enhancing flood risks, desertification etc. The conversion of natural areas on the coast

to artificial surfaces is growing at an even faster rate than population density. Housing (mostly secondary housing in many areas), services, recreation and transport infrastructure are the main causes.

- Quality / Preservation of cultural capital: refers to the quality of services provided by cultural capitals to society. It is important to identify cultural landscapes, sites, monuments and cultural facilities, since these resources are usually the ones which help in shaping the identity of a place, an area, an island, a region, etc. and they need protection, planning and management policies and actions in order to provide these services.
- Soil quantity and quality: refers to the preservation of ecosystem services and functions from soil, which supports agriculture and human life in general, provides a number of very important ecosystem functions that include the storing of precipitation and its infiltration in underground aquifers; provision of water and minerals to plants and the support of vegetation in general; sustaining complex microbial communities that absorb greenhouse gases and transform into minerals waste from living organisms among other functions. Soil quantity and quality is an environmental issue of great importance and is mostly related to cultivated soils that are in general under more pressures than the rest, but can also refer to soils that are used during urbanization. Apart from the type of land use, farming practices and management techniques are very important for determining the intensity of pressures on cultivated soils. Common threats include erosion and quality degradation that can result in desertification. Degraded soils are less productive and support less diverse ecosystems and this degradation is usually permanent (in human time scales). There are also soils affected from actions such as landfills and waste treatment in general, but also from industrial activities and urbanization. These soils may be severely degraded but on a relatively smaller scale compared to agricultural lands.
- Urban environment: refers to the quality of services provided by urban areas and the level of satisfaction of the society with them. With 75 % of Europe's population living in cities, urban land-use issues are currently of key importance. As a result, the demand for land in and around cities is becoming acute; urban sprawl is re-shaping landscapes and affecting people's quality of life and the environment as never before. Especially coasts are being urbanized at an accelerating speed and population sizes along Europe's coasts are continuously increasing, typically at higher rates than inland areas. Tourism, an activity of high spatial and seasonal impacts, contributes to a large extent for these developments in coastal areas of Europe. Cities in general

interact with and influence their hinterlands, affecting the environment of broader areas. Urban development results in increased consumption of energy, resources, transport and land, thereby raising greenhouse gas emissions and air and noise pollution to levels that often exceed recommended human health and safety limits.

- *Air quality/ pollution:* Air pollution remains a serious problem and continues to damage our health and the environment. From a human health perspective, the main outstanding air pollution problems are troposphere ozone and particulate matter, where acidification and ozone remain the main threats to ecosystems. Air pollution is a local but also a trans-boundary issue. Air pollutants released in an area may be transported in the atmosphere and harm human health and the environment elsewhere. Sources of air pollution are varied and may be anthropogenic (man-made) or natural. The pollution and quality of air is also responsible for atmospheric visibility.

The estimation or measurement of the values of the indicators is very much limited by the lack and the inconsistency of data. The fact that European Islands can be either NUTS 0 (Member States), NUTS II, NUTS III, LAU I or even LAU II has not allowed the completion of the data base of the project. Our efforts to fill the enormous gaps in the existing data (especially for the environment) with a number of local researches for both the sustainability and the attractiveness of islands did not meet the required response from stakeholders (see the results section for details). Since the current work is not a data-collecting but a policy oriented study, the estimation was completed with the available data and with the assistance of published work. Finally the study was constrained to focus on available data as are presented in the next part.

Special care was taken during the collection and compilation process for (i) the consistency of the data, to ensure comparability; (ii) the creation of time series; and (iii) the qualitative variables that were used from reliable sources and with the same type of assumptions. All these metadata for the variables are vital for a complete and reliable data set.

Table S2: Sustainability Variables and Indicators

	<b>Variable</b>	<b>Definition</b>	<b>Source</b>
Social cohesion	Unemployment rate	Development (evolution) of unemployment rate	EUROSTAT – ESPON 4.1.3 DB – NUTS 3
	Development of unemployment rate	variation of unemployment rates over time	EUROSTAT – ESPON 4.1.3 DB – NUTS 3
	Youth unemployment.	Unemployment rate < 25 years %	EUROSTAT – ESPON 4.1.3 DB – NUTS 2
	Long term unemployment rate		EUROSTAT – ESPON 4.1.3 –



	Variable	Definition	Source
			NUTS 2
	Early school leavers	% of	
	Life expectancy	is the average expected lifespan of an individual	
	Multicultural society	% Ethnic minorities and other nationalities in population	
	At persistent risk of poverty rate	Population share with 60 % of the national equivalent median income	
	Intra-regional income dispersion	- Gini index - Highest income quantile / lowest income quantile (example S80/S20 = highest quintile / lowest quintile)	
	Regional price index	Price (in common currency) of a selected basket of goods (adapted to the local culture and habits) Could be approached through some proxy, such as just one or two products (e.g. average house prices), but this does not take into account cultural differences	
Population's Structure and development	Population evolution (time series)		ESPON Data base
	Population pyramid		ESPON Data base
	Births, deaths (time series)		
	Fertility rate	Number of children per women	ESPON 1.1.4 - Atlas – NUTS2
	Migratory balance	((Population at the end of the period - Population at the beginning of the period) - (births - deaths))/ total population at the beginning of the period	EUROSTAT - ESPON 1.1.4 / 4.1.3 DB – NUTS 2/3
	Female activity rate		EUROSTAT – ESPON 4.1.3 – NUTS 2
	Male activity rate		EUROSTAT – ESPON 4.1.3 DB – NUTS 2
	Ageing of population	Share of Population over 64 years %	EUROSTAT – ESPON 4.1.3 DB – NUTS 2
	Dependency rates	Share of population under 15 and over 64 years %)	ESPON DB
	Components of population development	Population development Index	ESPON 1.1.4 DB – NUTS 2/3
Economic effectiveness	GDP in PPS per capita (time series)	Employment (time series)	EUROSTAT – ESPON 4.1.3 DB – NUTS 3
	Growth rate of GDP in PPS per capita	Employment rate	EUROSTAT – ESPON 4.1.3 DB – NUTS 3
	GDP per employee	GDP per employee	EUROSTAT – ESPON 4.1.3 DB – NUTS 3
Economic Development and Fragility	Share of agriculture, forestry and fishery in the regional added value (%)	added value in Agriculture, Forestry and Fisheries / total added value	EUROSTAT – ESPON 3.4.2 – NUTS 3
	Share of technological manufacturing industries in the regional added value	added value in machine tools (Dk), electric and electronic equipment (DI), transport equipment (Dm) / total added value	EUROSTAT – ESPON 3.4.2 – NUTS 3
	Share of financial and business services in the regional added value	Added values in the financial (J) and business (K) services/total added value	EUROSTAT – ESPON 3.4.2 – NUTS 3
	Share of administration, education, health and social services in the regional added value	Added value in administration (L), Education (M), Health and social services (N)/ total added value	EUROSTAT – ESPON 3.4.2 – NUTS 3
	GDP per economic activity		
	Employment per economic activity		
Environmental Preservation	Population density	total population / total area	EUROSTAT – ESPON 3.1 / 3.2 DB – NUTS 3 / LAU 2
	Residence density	(population + tourist beds + non permanent residents)	
	Island Vulnerability index		
Air quality – pollution	Exposure of ecosystems to acidification, eutrophication and ozone	CSI 005	EEA webpage
	Renewable energy consumption	% of Renewable energy of total energy consumption	EEA -

	Variable	Definition	Source
Water resources	Water Exploitation Index	The mean of annual abstraction of freshwater divided by the mean annual total renewable freshwater resource (EEA – CSI 018)	EEA – NUTS 0
	Drinking water quality	Conformity to standards for Microorganisms, pesticides, nitrate, chemicals, heavy metals (Water Directive EU -10)	EEA -
	Saltwater intrusion	Chloride in groundwater	EEA -
Coast and Seas	Bathing water quality	CSI 022 (Directive 76/160/EEC)	EEA -
	Nutrients in coastal water	WEU4	EEA -
	Coastal erosion		EEA – Euroision 2004 NUTS 3
	Sea surface temperature changes		Europe’s environment 4 <sup>th</sup> assessment
	Changes in sea level rise	Millimetres per year	Impacts of Europe’s changing climate, 2008
	Statuts of marine fish stocks	The indicator tracks the ratio of the number of overfished stocks to tht total number of commercial stochs per fishing area - CSI 032	EEA -
	Coastal zone with Natura 2000	% of coastline covered by land/seas sites	EEA -The State of the environment of the Coastal Areas 6/2006 – NUTS 3
Biodiversity	Fragmentation index	Calculated as proportion of fragmented areas to homogeneous areas	GTK – ESPON 2.4.1 – NUTS 3
	Fragmentation by urbanisation, infrastructure and agriculture		CORINE - EEA
	Species diversity	CSI 009	
	Coverage of protected areas	Share of Natura 2000 area in %	ESPON 2.4.1 DB – NUTS 3
	Land consumption by transport infrastructure		CORINE – ESPON 4-1-3 – NUTS 3
Land use/landscape quality	Desertification index	Sensitivity to desertification index	EEA – Diversification in the Mediterranean Region
	Soil Erosion	Annual soil erosion risk by water based on estimates of annual soil lost	EEA – Agriculture and the Environment – The IRENA indicator report – NUTS2/3 OR Impacts of Europe’s changing climate 2008
	Share of Agricultural Land under Organic Farming	% organic farming area/ UAA	EEA – Agriculture and the Environment – The IRENA indicator report – NUTS2/3
	Artificialisation of coast	Share of built up area in the 0-1 km costal strip OR % of artificial coastline length	EEA – The State of the Environment in the Coastal Areas - NUTS 3
Waste	Municipal waste production	Kg/capita	EEA – The road from landfill to recycling – NUTS 0
	Municipal waste treatment	% par category of treatment (landfill, recycling, incineration)	EEA – The road from landfill to recycling – NUTS 0

### 2.1.2. Variables for the attractiveness of islands and data collection strategies: data bases and local researches on cases studies

The second question concerns the *causes* of the current situation. The overall context links the existing situation within the area (effect) with its level of attractiveness (cause). Generally speaking, the low attractiveness of the islands is a result of two linked factors: (a) from insularity characteristics; (b) from their generally low economic development level (compared to that of the mainland). This low level of development is linked in most cases with some of the insularity characteristics, which are permanent and therefore cannot be easily modified, such as small population size, isolation

and accessibility. Concurrently, low levels of economic development can also be linked to various other factors, which arise both internally or externally (e.g., the resources – human, natural and economic- of the island; the overall state of the economy at the national level or the effects of globalization).

Production on islands became increasingly ineffective in economic terms, since imported products turned out to be cheaper and of higher quality and as a result, insular companies moved to the mainland or ceased their operation. This, in turn, resulted in the out-migration of the most productive and innovative portion of the population (entrepreneurs, scientists and artists). To make matters worse, the economic marginalization of islands was followed by their political and cultural peripherality. Therefore, islands became less attractive for economic activities and permanent residence, with some notable exceptions of islands with high degree of tourism development.

Since regional attractiveness has been explored in previous EU studies (mainly in Economic and Social Cohesion and ESPON 2006 reports) a lot of parameters have already been identified: Lisbon performance, labour market, accessibility and hazards are among the most important, even if some variables in these reports are not directly pertinent for the vast majority of islands (e.g., distance from a railway station). This means that certain other parameters have to be added in order to take into account “insularity”.

Here, attractiveness is studied in two dimensions: **the first relates to enterprises and economic activities in general; the second concerns the population.**

Attractiveness for companies depends upon factors such as economic motivation generated through policies, availability and quality of human resources (labour market), research and innovation actions, access to Information and Communication Technologies (Lisbon Performance), accessibility, access to economic and social infrastructures (public and private), the size of the local market, the quality of governance, the quality of the environment (in terms of providing abundant resources), hazards and security.

Attractiveness for the population is related to the standards of living and the quality of life and depends upon factors such as occupation opportunities, accessibility, access to different economic and social services (public and private), naturalness, quality of governance, hazards and security. Table S3 provides a list of these factors.

Table S3: Issues that affect the Attractiveness of Islands for Companies and Population

<b>Attractiveness for</b>	
<b>Companies</b>	<b>Population</b>
Accessibility	Accessibility
Labor qualifications/ cost	Employment and career opportunities
Services & infrastructure in support of businesses /Reception facilities	Access at and quality of public interest services
Incentives for companies	Security
Agglomeration economies /Size of market	Urban dynamism (cultural and social life)
Value of land	Value of land / housing
Research and innovation	Cultural identity
Social capital	Social capital
Governance quality (vision, strategy, mobilization....)	Governance quality (vision, strategy, mobilization....)
Environmental and cultural heritage / capital	Environmental and cultural heritage / capital
Hazards	Hazards
ICT facilities and use	ICT facilities and use
Networking services	

A more thorough analysis of these factors follows, while variables and indicators assessing them are presented in Table S4.

### **Attractiveness for Companies**

- **Accessibility:** refers to the real time needed to access an island, compared to the respective time necessary to cover the same distance in the European mainland. Costs are also taken under consideration. Accessibility is one of the most important factors, especially for areas that are geographically disadvantaged in terms of easy access, such as islands. It is a relative term and it depends with what it is compared against. At the local level, accessibility may refer to the ease of access to the area from a centre of local importance. At the European level, it may refer to the ease of access to one of the "central" urban centers. Another aspect of its relative value is the means of transportation between the areas. Different means entail diverging levels of access. Therefore, the assessment of the level of accessibility is a function of many different factors. For islands, the most important factor is the **geographical discontinuity of space**. Another important factor that is related with and stems from the first refers to the fact that **island accessibility is linked with public transport**. With some minor exceptions of small islands, marine transportation is

performed via ferries and has to observe their schedules and traveling frequencies. This raises more obstacles as the frequency of connections has to be taken into account when estimating accessibility. Methods for estimating the level of accessibility for the European space fail to take into account this geographical discontinuity of space and are unsuitable for islands. Another effort (EURISLES 1998, for a European level and Spilanis et al., 2005, for an application at a more local scale), use the "virtual distance" to calculate a "remoteness index" or "accessibility index".

The index measures the 'virtual distance' of islands from central ports or from a certain place in the mainland or on another island, by taking into account the frequency of connections between the two points, standard waiting time at a port and possible intermediate ports between the two points. The formula for calculating virtual distance is given in equation (1):

$$VD = (RT + BT + WT + (P * 168/N)) * TS \quad (1)$$

Where:

- VD stands for the Virtual Distance in Km;
- RT stands for the Real Travel Time between the port and the destination in hr and includes the total travel time for all possible stops of the ferry if there are two ferry trips to reach the destination);
- BT stands for Boarding Time in hr (i.e. the time required to be in the port in order to get on the ferry that is 2hr for major ports and 1hr for smaller ones);
- WT stands for possible waiting time the total trip includes a change of ferries in a port in hr;
- P stands for the probability to catch the ferry: If there is one daily connection then there is a possibility of having to spend 12 hours ashore on average and  $p = 12/24 = 0.5$ , for 2 daily connections  $p = 6/24 = 0.25$ , for 3 daily connections  $p = 4/24 = 0.17$ , and for 4,  $p = 2/24 = 0.08$ ;
- N stands for the frequency of weekly connections between the departure and the destination port;
- TS stands for the travel speed of the ferry in Km/hr.

This index presents some important advantages and some drawbacks. The most important advantage is that it takes into account the frequency of connections and can be used to reveal seasonal differences of accessibility for the same island or group of islands. Another important advantage is that it is flexible and can be calculated for separate islands or for groups of islands with some

assumptions. It can also be calculated for the same island via different ports.

Its disadvantages include the fact that the quality and capacity of boats is not included in the index and this can be of great importance also. Additionally, other means of transportation such as aircrafts or speed boats are not included, but since generally bigger islands are favoured by these means which are the ones with greater frequencies anyway, comparisons can be performed only for "conventional" ferries.

The data for the calculation of the index are provided by EUROSTAT/ ESPON data and by the Stakeholders and Case study research.

- **Labor qualifications / cost:** refers to the quality of human capital (usually estimated with the level of education and/or training) which can be a criterion for businesses to operate in an area, but also a feature that characterises the performance of those that already operate in an area. The labor cost is also an important parameter to a business operation and viability (as e.g. the high cost to bring and keep in a small island a specialist/ expert/ consultant/ scientist).
- **Services & infrastructure in support of entrepreneurship/ Reception facilities:** refers to the type of services and facilities/ infrastructure which are available to support a new or an already operating business.
- **Incentives for companies:** refers to all kinds of direct and indirect subsidies, provisions, or cost reduction policies, which are aiming to reduce the cost, either for the setting up or the operation of an enterprise.
- **Agglomeration economies/Size of market:** refers to the size of the local market as a measure to attract enterprises and free lancers, who can cover local needs.
- **Value of land:** refers to the cost for buying land for the setting up of enterprises and the construction cost.
- **Research and innovation:** refers to the production of new knowledge/know how and its incorporation into the production lines and services, recorded in the form of research facilities (e.g. research institutes and universities) and scientific employment.
- **Social capital:** refers to the degree of trust, cooperation and cohesion that exists between the businesses, the administration, the public and their representatives, as well as between themselves.
- **Governance quality (vision, strategy, mobilization, etc.):** refers to the effectiveness of the operation of local authorities and

the procedures to involve stakeholders in planning and decision making processes.

- ***Environmental and cultural heritage / capital***: refers to the effective management and the valorisation of the environmental and cultural capital, which creates opportunities for businesses, as well as external economies for activities such as tourism. It is considered as an element of quality of everyday life for the local residents as well, offering them recreational opportunities.
- ***Hazards***: refer to all types of uncertainties and hazards (environmental, technological and political) that may affect an area, with respect to the risks for companies and the population.
- ***ICT facilities and use***: refer to the existence of broadband networks and the degree of their use from the enterprises, the households and the public services of the area.
- ***Networking services***: refers to the existence of good quality services with respect to energy provision, local transportation, telecommunications, water and sewage networks, to support the operation of enterprises and households.

### **Attractiveness for Population**

- ***Accessibility***: (See *Attractiveness for Companies*)
- ***Employment and career opportunities***: refers to the possibility of local residence to find a job relative to their qualifications and their ambitions.
- ***Access at and quality of public interest services***: refers to the existence, the quality and the cost of acquiring public interest services such as health, education, training and other administrative services (transport, communication and energy provision are included under Networking Services).
- ***Security***: refers to the existence and the degree of local criminal activities and the sense of safety in an area.
- ***Urban dynamism (cultural and social life)***: refers to the existence of cultural and social life in an area, something which is related and influenced by its population size.
- ***Value of land / housing***: refers to the cost for buying land for housing and its construction.
- ***Cultural identity***: refers to the sense of "belonging" to an area and provides a distinct identity that can affect decisions of residence or settling in an area.
- ***Social capital***: (See *Attractiveness for Companies*).

- **Governance quality (vision, strategy, mobilization....):** (See *Attractiveness for Companies*)
- **Environmental and cultural heritage / capital:** (See *Attractiveness for Companies*)
- **Hazards:** (See *Attractiveness for Companies*)
- **ICT facilities and use:** (See *Attractiveness for Companies*)

The Table S4 presents the list of the above analysed attractiveness parameters linked to specific variables. There is also the definition of variables and possible source of data from the different European bodies and organisms. From this exhaustive work it becomes clear that for many of the proposed variables there is no data at the level initially desired (level of the island) and in several cases there is no data either for the level NUTS3 or even for the level NUTS2. This fact has influenced the choice of the variables that are finally used for the analysis.

Table S4: Attractiveness variables and indicators

	Variable	Definition	Source
Urban dynamism	primacy rate	the share of the largest urban area within an island/ region	EUROSTAT – ESPON 2.4.2 – NUTS 2/3
	Urban influence	Existence of FUA	ESPON 1.1.1. / 1.1.2 / 3.3 /NUTS 3
	Human intervention (high, medium, low)		ESPON 1.1.1. / 1.1.2 / 3.3 /NUTS 3
Public Services Accessibility	Accessibility (transport)	Accessibility to islands from a central European city and/or to the national center and/or the regional center	Annex 8
	Potential accessibility, multimodal, to population	To be used for weighting incentives to areas	ESPON 1.2.1 – NUTS 3
	Average travel time to three higher hierarchical cities		
Health	Accessibility to hospital	Accessibility to the nearest hospital	
	Accessibility to hospital	Accessibility to the frequently used hospital	
	Accessibility to hospital	Number of hospital beds per inhabitant	
Water	Waste Water Collection and Treatment System	% of population connected to a waste water collection and Treatment System	
Education	Accessibility to High Secondary School		
	Accessibility to Technological Education		
	Accessibility to training structures		
ICT	Population with broadband access	% of population with broadband network access	
	Households with Internet access	% of households with internet access	
	Companies with Internet access	% of companies with internet access	
Culture	Infrastructures for Cultural Activities	Number of places for cultural events (theatre, cinema, ....)	
Lisbon Strategy competitiveness	Population by highest educational level attained	% of population with tertiary level education as share of population aged 15 years and above	EUROSTAT – ESPON DB – NUTS 2
	investment rate	the share of the gross fixed capital formation of businesses in the regional GDP	EUROSTAT – ESPON 4.1.3 – NUTS 2
	Employment in high tech	persons employed in medium-high and high-tech sector of manufacturing as share of total	EUROSTAT – ESPON 4.1.3 DB – NUTS 2



	Variable	Definition	Source
		employment, in %	
	R&D	Expenditure for R&D of GDP %	EUROSTAT – ESPON 4.1.3 – NUTS ½
	R&D personel % of total employment	share of employees in research and development (both in the private and public sector) in the total amount of employees	EUROSTAT – ESPON DB – NUTS 3
	Labor cost	average income per employee (in 1000Euro)	EUROSTAT – ESPON 4.1.3 DB – NUTS 2
Job opportunities	Youth unemployment. Unemployment rate < 25 years %	Activity rate, employment increase	
Risks – Quality of environment	Flood endangered settlement and artificial areas (Corine)	Total number of flood events from 1987 to 2002 multiplied with share of artificial surface	CORINE, GTK – ESPON 4.1.3 – NUTS 3
	Land use changes	Share between natural (forest, grassland, internal waters, wetlands)/ semi-natural (agricultural) and artificial areas	
	Percentage of artificial area - Corine	Share of artificial area in total area	CORINE - ESPON 4.1.3 DB – NUTS 3
	Evolution of natural surfaces	Share of natural surfaces in total surface	CORINE
	Loss of land from agriculture to artificial surfaces	Change from Agriculture to artificial land, % difference to European mean value	CORINE – Land cover accounts NUTS 2/3
	Natural and Technological Hazards	Hazards classification index	ESPON 1.3.1 – NUTS 3
	Vulnerability from natural and technological hazards	Integrated vulnerability index	ESPON 1.3.1 – NUTS 3
	Risk from sea level raising	% of land to be covered from sea level raising	
Political risk	Risk from illegal migration		
Social capital	Trust in the legal system	Share of persons having complete trust/ no trust at all in the legal system of a country	European Social Survey – NUTS 0
	Politics to complicate to understand	Share of persons finding politics too complicated to understand (never+seldom/regularly+frequently)	European Social Survey – NUTS 0
	worked in an organisation or association (other than a party) in the last twelve months.	Share of persons working in an organisation or association (other than a political party) within the last 12 months	European Social Survey – NUTS 0
Governance	way in which roles and responsibilities are distributed among the different government levels		
	way in which roles and responsibilities are distributed local government and other involved actors		
	describes the related processes of negotiation and consensus-building within the territorially oriented political fields. Supporting sustainable spatial development or stimulating innovative economic activity		
	Level of administrative (+ other) functions on islands	number of administrative (+ other) functions on islands	
	Effectiveness of public administration (4 <sup>th</sup> C.R)		
CAPITALS	Number of cultural sites	Number of registered monuments and sites in national lists, weighted by number of 'excellence' resources - or same approach of calculation, normalised by square km	ESPON 1.3.3 DB – NUTS 3
	Natural areas (NATURA 2000)	Share NATURA 2000 area of total area in %	CORINE – ESPON 3.1 – NUTS 3

### 2.1.3. Methodology for the Research in the Case Studies

This part of the overall approach is vital for providing information and data for smaller islands and islands that are not autonomous administrative entities. The selection of nine case studies<sup>8</sup> was based on:

1. The resident population, with three categories:
  - Large islands: >50,000 permanent inhabitants
  - Medium-sized islands: between 5,000-50,000 permanent inhabitants
  - Small islands: <5,000 permanent inhabitants.
  - The administrative status (or jurisdiction) as an indication of autonomy and power for the promotion of policies tailored to the islands' characteristics. At the levels of the independent state, NUTS II and NUTS III regions, data is readily available and thus an analysis is possible, as already mentioned. The problem rests on the fact that, generally, data is not available at a lower statistical level.
2. The geographical distribution and location of the islands, with a rough distinction which between the islands of the North (Baltic/ North Atlantic, with colder climate, seasonally strong domestic tourism, higher GDP per capita) and those of the South (Mediterranean, warmer climate, mass international tourism, lower GDP per capita, frontier zones with North Africa and arenas of illegal immigration into the EU).
3. The development status of the island, with the use of 4 levels, according to the EU-objectives that determine the European financial aid:
  - Convergence Regions: (NUTS 2 regions with GDP per capita of less than 75% of EU average);
  - Phasing-out Regions: (Regions which would still be eligible as Convergence regions if the threshold was estimated for EU15 and not EU25);
  - Phasing-in Regions: (Regions formerly Objective I, but presently with GDP per capita over 75% of EU15); and
  - Competitiveness and Employment Regions: (All remaining regions not covered by the three types above).

Coastal and Nuts III islands are classified with the mainland region within which they are administratively attached (for example, Orkney with the Highlands and Islands Region of

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<sup>8</sup> Even if within the project's specifications it was mentioned that the case studies have to be between 4 and 6, the demand of the stakeholders was so high that finally 9 case studies have been selected.

Scotland; Hydra with the Attiki Region of Greece; and Ouessant with the Bretagne Region of France).

According to these criteria, the categorization of the islands with more than 50 inhabitants is presented in Table S5 (average population counts are drawn from census data).

Table S5: Categorization of European Islands

	SIZE	DEVELOPMENT STATUS	STATE (0)	NUTS II (1)	NUTS III (6)	ISLAND (224)	
NORTH (231)	LARGE (2)	Convergence					
		Phasing-out					
		Phasing-in					
		Comp. & Empl.			GOTLAND-SE WIGHT-UK		
	MEDIUM (14)	Convergence					HIIUMAA-EST, SAAREMAA-EST
		Phasing-out				LEWIS & HARRIS-UK, MAINLAND ORKNEY-UK, MAINLAND SHETLAND-UK	UIST-UK, BUTE-UK, SKYE-UK
		Phasing-in					
		Comp. & Empl.		ÅLAND-FI	BORNHOLM-DK	TEXEL-NL, FOHR-DE, BORKUM-DE, NORDERNEY-DE	
	SMALL (215)	Convergence					HIDDENSEE-DE, OSMUSSAAR-EST, ABRUKA-EST, MANILAID-EST, RUHNU-EST, KASSARI-EST, VORMSI-EST, KIHNU-EST, MUHU-EST, VILSANDI-EST, PIIRISSAAR-EST, PRANGLI-EST BARDSEY-UK, SAINT MARTIN'S-UK, SAINT MARY'S-UK, TRESKO-UK
		Phasing-out					FOULA-UK, EGILSAY-UK, HOUSAY-UK, COLONSAY-UK, FAIR-UK, EIGG-UK, EASTBURRA-UK, PAPA WESTRAY-UK, UNST-UK, NORTH RONALDSAY-UK, WHALSEY-UK, TRONDRA-UK, FLOTTA-UK, IONA-UK, GIGHA-UK, RAASAY-UK, EDAY-UK, COLL-UK, LUIING-UK, JURA-UK, ROUSAY-UK, SHAPINSAY-UK, FETLAIR-UK, STRONSAY-UK, HOY-UK, SANDAY-UK, WESTRAY-UK, TIREE-UK, WESTBURRA-UK, BRESSAY-UK, YELL-UK, BARRA-UK, VATERSAY-UK, MULL-UK, ISLAY-UK, ARRAN-UK, EASDALE-UK, LISMORE-UK, SEIL-UK, TIREE-UK, BENBECULA-UK, BERNERAY-UK, ERISKAY-UK, GREAT BERNERA-UK, GRIMSAY-UK, NORTH UIST, UK, SCALPAY-UK, SOUTH UIST-UK, VATERSAY-UK, GREAT CUMBRAE-UK, BURRAY-UK, SOUTH RONALDSAY-UK, PAPA STRONSAY-UK, STRONSAY-UK, MUCKLE ROE-UK, TRONDRA-UK, WHASLAY-UK
		Phasing-in					TORY-IE, CLARE-IE, INISHBOFIN-IE, INISHMAAN-IE, INISHEER-IE, ARANMORE-IE, INISHMORE-IE, TORAIGH-IE, INISHTURK-IE, SHERKIN-IE, BERE ISLAND-IE

		Comp. & Empl.				GRODE-DE, HOOGE-DE, BALTRUM-DE, SPIEKEROOG-DE, WANGEROOG-DE, PELLWORM-DE, JUIST-DE, HELGOLAND-DE, LANGEOOG-DE, AMRUM-DE, NORDSTRANDISCHMOOR-DE, ENDELAVE-DK, ASKO-DK, MANDO-DK, TUNO-DK, AVERNAKO-DK, DREJO-DK, LYO-DK, ANHOLT-DK, OMO-DK, FEMO-DK, STRYNO-DK, AGERSO-DK, SEJERO-DK, FEJO-DK, LAESO-DK, FANO-DK, ERO-DK, <b>SAMSO-DK</b> , EGHOLM- DK, FUR-DK, HJARNO-DK, ORO-DK, VENO-DK, AARO-DK AASLA-FI, ATTU-FI, KEISTIO-FI, MIELISHOLM-FI, UTO-FI, JURMO-FI, SEGLINGE-FI, SAVERKEIT-FI, KASNAN-FI, LAPPO-FI, HITIS-FI, ENKLINGE-FI, MOSSALA-FI, NORRSKATA-FI, VARTSALA-FI, SOTTUNGA-FI, BJORKO-KIVIMO-FI, INIO-FI, SKALDO-FI, BAROSUND-FI, ROSALA-FI, KUMLINGE-FI, PELLINKI-FI, <b>KOKAR-FI</b> , BRANDO- FI, HOUTSKAR-FI, VARDO-FI, BERGO-FI, FOGLO-FI, SUOMENLINNA-FI, HAILUOTO-FI, KORPO-FI, NAGU MAIN ISL-FI, HOEDIC-FR, AIX-FR, ARZ-FR, HOUAT-FR, MOLENE-FR BREHAT-FR, BATZ-FR, OUESSANT-FR, GROIX-FR, BELLE-ILE-FR, YEU-FR, MOLENE-FR, SEIN-FR, ILE AUX MOINES-FR CLEAR-IE, SCHIERMONNIKOOG-NL, VLIELAND-NL, AMELAND-NL, TERSCHELLING-NL, ARHOLMA-SE, RAMSO-SE, HOLMON-SE, SVARTSO-SE, KOPSTADSO-SE, SANDON-SE, NORD KOSTER-SE, INGMARSO-SE, HERMANO-SE, LYRON-SE, ORNO-SE, UTO-SE, MOJA-SE, SYD KOSTER-SE, RUNMARO-SE, STORA DYRON-SE, RORO-SE, TYNNINGO-SE, VEN-SE, VRANGO-SE, YXLAN-SE, ASPO-SE, MARSTRAND-SE, BLIDO-SE, FARO-SE, HALSO-SE, BRANNO-SE, LJUSTERO-SE, DONSO-SE, STYRSO-SE, OCKERO-SE, HONO-SE, TYNNINGÖ-SE, HEMSÖN-SE, GRÄSÖ-SE, TJOCKÖ-SE, VÄRINGSÖ-SE, LADNA-SE, SANDHAMN-SE, RINDÖ-SE, SKARPÖ-SE, STORHOLMEN-SE, TRANHOLMEN-SE, ORNÖ-SE, OAXEN-SE RATHLIN-UK	
	<b>SIZE</b>	<b>DEVELOPMENT STATUS</b>	STATE (2)	NUTS II (4)	NUTS III (11)	ISLAND (114)	
<b>SOUTH (131)</b>	<b>LARGE (13)</b>	<b>Convergence</b>	<b>MALTA - MLT</b>	SICILIA-IT, KRITI-GR	KERKYRA-GR, LESVOS-GR, <i>MALTA island-MLT</i>	ISCHIA-IT	
		<b>Phasing-out</b>					
		<b>Phasing-in</b>	<b>CYPRUS- CYP</b>	<b>SARDEGNA-IT</b>			RODOS-GR
		<b>Comp. &amp; Empl.</b>			CORSE-FR	<b>MALLORCA-ES, MENORCA-ES, EIVISSA-ES</b>	
	<b>MEDIUM (30)</b>	<b>Convergence</b>				ZAKYNTHOS-GR, KEPHALONIA-GR, SAMOS-GR, CHIOS-GR, SKOPELOS-GR, SKIATHOS-GR, IKARIA-GR, LIMNOS-GR, THASSOS-GR, PROCIDA-IT, CAPRI-IT, <b>LIPARI-IT</b> ,	

			GOZO-MLT	PANTELLERIA-IT
	Phasing-out			AEgina-GR
	Phasing-in			KARPATHOS-GR, LEROS-GR, <b>KALYMNOS-GR</b> , KOS-GR, MYKONOS-GR, TINOS-GR, ANDROS-GR, THIRA-GR, PAROS-GR, NAXOS-GR, SYROS-GR, MADDALENA-CAPRERA-IT, SAN PIETRO-IT
	Comp. & Empl.			FORMENTERA-ES, ELBA-IT
SMALL (88)	Convergence			KASTOS-GR, ANTIPAXOS-GR, OTHONI-GR, MATHRAKI-GR, ERIKOUSSA-GR, KALAMOS-GR, MAGANISSION-GR, PAXI-GR, ITHAKI-GR, GAVDOS-GR, ALONISSOS-GR, THYMAINA-GR, EFSTRATIOS-GR, PSARA-GR, OINOUSSAI-GR, FOURNI-GR, SAMOTHRAKI-GR, TOURLIS-GR, STEFANION-GR, NISOS-GR LEVANZO-IT, MARETTIMO-IT, FAVIGNANA-IT, ALICUDI-IT, FILICUDI-IT, PANAREA-IT, STROMBOLI-IT, VULCANO-IT, SALINA-IT, LINOSA-IT, LAMPEDUSA-IT, SAN DOMINO-IT, USTICA-IT,
	Phasing-out			ANTI-KYTHIRA-GR, AGISTRI-GR, AMOULIANI-GR, YDRA-GR, KYTHIRA-GR, POROS-GR, SPETSES-GR, PALAION TRIKERION-GR
	Phasing-in			ARKI-GR, PSERIMOS-GR, TELENDOS-GR, AGATHONISSI-GR, TILOS-GR, MEGISTI-GR, CHALKI-GR, <b>LIPSI-GR</b> , ASTYPALAIA-GR, KASSOS-GR, NISYROS-GR, SYMI-GR, PATMOS-GR, DONOUSSA-GR, IRAKLIA-GR, SCHINOUSSA-GR, THIRASSIA-GR, SIKINOS-GR, ANAFI-GR, KOUFONISSI-GR, FOLEGANDROS-GR, KIMOLOS-GR, ANTIPAROS-GR, SERIFOS-GR, KYTHNOS-GR, AMORGOS-GR, IOS-GR, KEA-GR, SIFNOS-GR, MILOS-GR, SKYROS-GR, TRIZONIA-GR, FARMAKONISI-GR ASINARA-IT,
	Comp. & Empl.			PORT-CROS-FR, ILE DU LEVANT-FR, PORQUEROLLES-FR, VENTOTENE-IT, PONZA-IT, GORGONA-IT, CAPRAIA-IT, PIANOSA-IT, GIGLIO-IT, PALMARIA-IT, SALINA-IT

**LEGEND:**

Convergence:

Phasing-out:

Phasing-in:

Comp. & Empl.:

Convergence Regions

Phasing-out Regions

Phasing-in Regions

Competitiveness and Employment Regions

The number of the islands in each category is summarised in Table S6.

Table S6: Number of Islands in Each Category

	SIZE	DEVELOPMENT STATUS	STATE (0)	NUTS II (1)	NUTS III (6)	ISLANDS (224)	
NORTH (231)	LARGE (2)	Convergence (0)					
		Phasing-out (0)					
		Phasing-in (0)					
		Comp. & Empl. (2)			2		
	MEDIUM (14)	Convergence (2)					2
		Phasing-out (6)				3	3
		Phasing-in (0)					
		Comp. & Empl. (6)			1	1	4
	SMALL (215)	Convergence (16)					16
		Phasing-out (56)					56
		Phasing-in (11)					11
		Comp. & Empl. (132)					132
	SIZE	DEVELOPMENT STATUS	STATE (1)	NUTS II (5)	NUTS III (8)	ISLANDS (117)	
SOUTH (131)	LARGE (13)	Convergence (6)	1	2	3 (2)	1	
		Phasing-out (0)					
		Phasing-in (3)	1	1		1	
		Comp. & Empl. (4)		2	2		
	MEDIUM (30)	Convergence (14)				5	9
		Phasing-out (1)					1
		Phasing-in (13)					13
		Comp. & Empl. (2)					2
	SMALL (88)	Convergence (34)					34
		Phasing-out (8)					8
		Phasing-in (34)					34
		Comp. & Empl. (12)					12

The political interest showed by the stakeholders following this project and reiterated by members of the ESPON Monitoring Committee, it was important to ensure conciliation between the more scientific criteria and the policy demand; so finally 9 case studies were selected.

The final choice was based on more considerations:

- First, it is critical that all the 4 sub-categories of islands (coastal islands, archipelagos, island regions and island-states) are represented;
- Second, the small islands are well represented within the selection of four out of the nine islands;
- Third, big islands are represented by 2 island-states, 1 NUTS 2 region, and 1 NUTS 3 area, and
- Finally, some more specific features are taken into account as the model of tourism development for Mallorca, Kalymnos for its specialization in fisheries, and with the small island of Lipsi are within the archipelagos of Dodecanese at the external frontiers of EU, the energy performance of Samso, the fact that Saaremaa has recently entered in the EU.

The Greek islands of Kalymnos and Lipsi are considered as one case study in an archipelago area which displays large intra-regional disparities.

Table S7: The 9 Selected Case Study Islands

		<b>LARGE</b>	<b>MEDIUM</b>	<b>SMALL</b>
<b>NORTH</b>	CONVERGENCE REGIONS		Saaremaa-EST (coastal)	
	PHASING-OUT REGION			
	PHASING-IN REGION			
	COMPETITIVENESS & EMPLOYMENT REGIONS			Samsø-DK (coastal island) Kökar-FI (island of insular region)
<b>SOUTH</b>	CONVERGENCE REGIONS	Malta-MLT (Island state)	Lipari-IT (island of insular region)	
	PHASING-OUT REGION			
	PHASING-IN REGION	Cyprus – CY (island state) Sargegna – IT (NUTS 2)	Kalymnos-GR Lipsi-GR (archipelago)	
	COMPETITIVENESS & EMPLOYMENT REGIONS	Mallorca-ES (NUTS 3)		

The nine case studies, along with all the NUTS II and NUTS III regions were used to evaluate the state of the islands with both qualitative and quantitative information; to determine, classify and prioritise features that contribute, enhance or otherwise positively influence the attractiveness of specific islands; and to collect information on good practices and policies that have been used in order to address attractiveness and other aspects relating to insularity.

The necessary information was acquired from the ESPON data base, EUROSTAT, previous ESPON studies, international and national bodies and the stakeholders. Additionally, the research group conducted field work in the case studies. This field work was performed either by field trips on smaller islands, or with the assistance of local stakeholders with the use of questionnaires and forms. The target groups were: (a) local populations; (b) local businesses/ entrepreneurs; (c) local authorities.

Regarding the questionnaires, the most important difference refers to the type of questions regarding attractiveness: while the ones that were used to Local Authorities and Chambers of Commerce and Industry asked the respondents to classify attractiveness factors according to their *importance*, the ones used on residents and companies enquired on their *satisfaction* of the existing situation regarding these factors. Likert-type questions were used to facilitate quantitative analysis along a scale ranging from “agree completely” (value 2), “agree” (value 1), “neither agree nor disagree” (value 0),

“disagree” (value -1) and “disagree completely” (value -2) for a number of factors.

In the following sections, each research is analysed in more detail.

### **1. The research to local populations**

The research to local population theoretically refers to many different social groups, as attractiveness differs for different groups over characteristics such as age, education, occupation, family status, etc. For this particular research, permanent residents that live on the island for all their lives or at least for more than 15 years have to be interviewed

The type of research strategy and the sampling was different for these groups according to the size of the islands' population.

- For permanent residents on small islands: for a relatively small population the size of the sample was set at max 50 residents, with a sampling process that depended on the knowledge of the population, but everywhere either random or a combination of snowball and random sampling were used, based on the available population (i.e. those that are present at the time of the survey). In the case where the later two strategies will be adopted, the researchers need to take care that the sample is representative in broad terms with the overall population (e.g. to ensure that most of the sample will be old people on islands where the majority of the population are elderly). There can be no actual representative sample, but this approximation is still better than nothing.
- For permanent residents on islands with big populations: as a big sample was necessary to give reliable results, the decision was to distribute the questionnaires to local administrations (mayors).

### **2. Attractiveness parameters according to local businesses/entrepreneurs**

For local businesses a slightly different approach was used, as the type of business is very important for the approach followed here. As mentioned already in the sustainability section, the research is more interested in businesses that are involved in a “competitive” productive activity (e.g. ‘exporting’ products or services which bring income to the area; and preventing leakages).



The max size of the sample was set at 30 businesses in any case. For some small islands all such local businesses were covered (e.g. on Lipsi Island).

### **3. Information from all the islands and the project's stakeholders**

A very wide list of stakeholders –including decision makers from a large number of islands- was compiled and three different questionnaires were addressed to them (see Annex II for all questionnaires):

- (a) A questionnaire on attractiveness factors concerning households;
- (b) A questionnaire on attractiveness factors concerning companies; and
- (c) A form for recording best practices for policies and evaluation of European policies that are related with attractiveness.

The list includes:

- (a) Local Governments (Mayors of small islands and Directors/executives of NUTS II/III) that have received all three questionnaires and forms;
- (b) Presidents of Chambers of Commerce and Industry (CCI), (one per NUTS II/III area) that have received only the second questionnaire plus the form about best practices and European policies.
- (c) "Horizontal" stakeholders, such as the CRPM Islands' Commission, INSULEUR and ESIN that have distributed the questionnaires to their members.

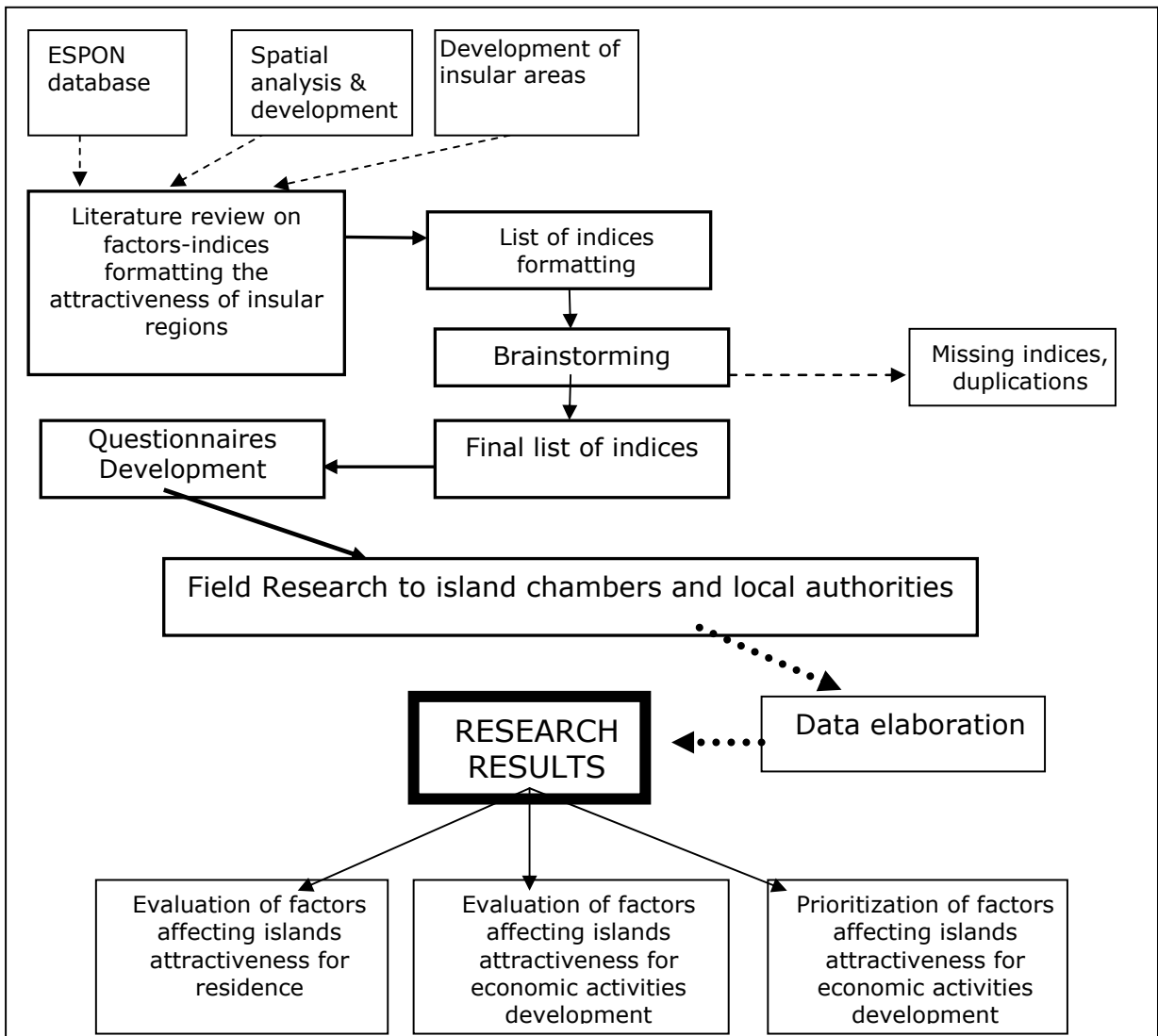
For most of these stakeholders the relevant questionnaires were attached either as e-mail attachments or as paper forms and were send back either digitally or printed.

### **4. Methodology for classification the attractiveness factors**

The total island attractiveness must be viewed through two distinctive approaches. The first is to unveil the factors that affect the attractiveness of islands as a place for residence and to estimate their values and their gravity. The second one is to unveil the factors affecting island attractiveness as a place to develop economic activities as well as their value and their importance.

The methodological framework is presented in figure S1.

Figure S2.1: The methodological framework of the research



The first step is to identify the potential factors that affect islands attractiveness, through a) a literature review and b) brainstorming sessions among the members of the research team. The aim is to conclude on a list of possible factors-indices that can be used in order to measure the attractiveness of insular areas. For that reason the literature review is focused on the examination of relevant topics such as spatial analysis and the development of insular areas as well as the ESPON’s database. After a list of factors was compiled, a brainstorming session was performed by the research team along with other external experts related with islands and “insularity”. The aim was to exclude similar factors and add more than the ones in the initial list.

Regarding the attractiveness of islands as a place for residence, the literature review and the brainstorming session concluded on the identification of 25 critical factors. The same approach concluded on

the identification of 24 critical factors for defining the island attractiveness as a place to develop economic activities.

Based on these factors, two lists were developed, one with the factors influencing island attractiveness for populations and one with the factors influencing island attractiveness for developing economic activities. Regarding the questionnaire on islands attractiveness for economic activities, the respondents asked to evaluate every factor in a Likert-type scale of 2-5 (with 2 being a very important factor for calibrating the islands attractiveness for economic activities and 5 being an insignificant factor). Finally there was also the option for the respondents to not express any opinion on a specific factor(s). Moreover the respondents asked also to rank the five most important factors from a total of 24.

Local authorities were requested to complete the questionnaire on economic activities attractiveness in the same way. They were asked to evaluate the 25 factors in a scale of 2-5 (with 2 being a very important factor for determining the islands attractiveness for living and 5 being an insignificant factor).

Particularly for the investigation of social capital among European regions which are insular (Cyprus, Illes Balears, North Aegean, South Aegean, Ionian Islands, Crete, Sicily, Sardegna and Bornholms Amt) or include island areas (Scotland, Mediterranean and Southern Finland Åland), data from round 1 of the European Social Survey (ESS, Jowell, 2003) were utilized except for Cyprus where data from Round 3 (Jowell, 2007) were used<sup>9</sup>. Details of the total sample are presented in Table 2. Regarding the characteristics of the sample, 53.6% of the respondents were female and 46.4% male. The average age for the total sample was approximately 48 years of age. Regarding educational level the highest percentage is presented among individuals who have completed upper secondary education (20.5%) followed by lower secondary or second stage of basic education (18%).

- **Social trust** was measured with three variables combined in one factor created through Explanatory Factor Analysis (EFA) (*'Most people can be trusted or you can't be too careful', 'Most people are fair or try to take advantage of you', 'Most of the time people are helpful or they are mostly looking out for themselves'*) (Cronbach's a reliability indicator: 0.81). All

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<sup>9</sup> R Jowell and the Central Co-ordinating Team, European Social Survey 2002/2003: Technical Report, London: Centre for Comparative Social Surveys, City University (2003); R Jowell and the Central Co-ordinating Team, European Social Survey 2006/2007: Technical Report, London: Centre for Comparative Social Surveys, City University (2007)

- questions were measured on a 0-10 Likert scale with lower scores representing lower levels of trust.
- **Trust in institutions** was also explored with a new variable created through EFA combining questions measuring the level of *trust for the national parliament, the legal system and the European Parliament* (Cronbach's  $\alpha$ : 0.78). All questions were measured on a 10 point Likert scale similar to the previous variables.
  - Another set of questions, combined through EFA, explored the **level of satisfaction for public issues** including *the level of satisfaction for the government, the economy, the way democracy works in the country, the health system and the educational system* (Cronbach's  $\alpha$ : 0.83). All questions were measured on a 10 point scale with lower scores representing lower levels of satisfaction.
  - Regarding **social networks**, the number of organizations that citizens are members or have participated as volunteers was estimated. Furthermore, the **level of interest in politics** was measured on a 4 point scale with lower scores revealing higher levels of interest for political issues.
  - Finally, the **feeling of safety** was also investigated. Respondents were asked to evaluate on a 10 point Likert scale their *Feeling of safety when walking alone in local area after dark*.

The data gathered have been processed with the Statistical Package for Social Sciences (SPSS v.17.0) software and the MS Excel. In total, 48 European island chambers participated in the research. From them 38 chambers completed the questionnaire part which referred to the prioritization of the five most important factors of attractiveness while all of them completed the questionnaire part for factors evaluation. As regards the local authorities' questionnaire, it has been completed by 40 authorities. 33 out of the 40 participants completed the factors prioritization task of the questionnaire while all of them completed the factors evaluation task. Differences of averages were investigated with one-way ANOVA tests or the t-test for differences between North and South Europe.

#### *2.1.4. Indexes for the comparison and the typology of islands: state, change and attractiveness*

In order to compare territories between them using more than one parameters, the creation of indexes is necessary. For the needs of this study the TPG has considered as useful for the analysis to create one index for each main topic of the study: the State of the islands and their Attractiveness. During the analysis an other index appeared as useful in order to describe their evolution during the

last years. For all these indexes the EU average is used as the base for every comparison, as it's usually done in all the EU studies, but also because a main goal of EUROISLANDS study is to compare islands to EU.

Finally, five different indexes were calculated:

(a) One for the state of the islands regions (NUTS 0, 2 and 3 statistical units) and the member states they are located in (State Index);

(b) One for changes that have taken place during 2000-6 (Change Index);

(c) Three for the attractiveness of the islands:

- One for attractiveness based on issues of accessibility and urban dynamism, the direct effects of insularity (Attractiveness Direct Index);
- One for attractiveness based on indicators that cover the rest of the attractiveness factors identified in the report as indirect effect of insularity (Attractiveness Indirect Index);
- One for the attractiveness based on the natural and cultural potential of the islands (Attractiveness Potential Index).

The 3 attractiveness indexes are not directly comparable and cannot be synthesized to a composite one as the availability of data is not homogeneous. For urban dynamism the Functional Urban Areas (FUA) concept was used, for which data are available only at NUTS 3 level, which is the case of the accessibility indicators as well. Therefore, a European average is not available and the classes that were used for the calculation of the index had to be estimated with different methods (details below). Data for Attractiveness Potential Index are also available for NUTS 2/3 regions. On the contrary, indicators for other attractiveness factors (education level, R& D and ICT) are available at NUTS 0 and NUTS2 level.

For the values of all indicators 9 classes were created. These classes were constructed with the basic assumption that the European average in the particular indicator and the values around this average should form the middle class and four classes should be constructed with higher values than the middle class and four with lower values. The middle class has a width of ten values and the six subsequent classes also have a ten value width, while the two extreme classes include all the values that are lower or higher. In the two cases where the European average was not available, the range of the values of the indicator was divided by nine and nine equal classes were created. The limits of the classes are presented in Table S9.

Table S9: Limits of the classes used for the construction of the indexes

Class	Indicators of change, where EU27 change = 0%	Indicators where EU27 = 100	FUA (Max=5, min =0)	Accessibility (Max=190, min = 24)
1	<-35	< 65	0 to 0,55	24 to 42,4
2	-35 to -25	65-75	0,55 to 1,1	42,4 to 60,8
3	-25 to -15	75-85	1,1 to 1,65	60,8 to 79,2
4	-15 to -5	85-95	1,65 to 2,2	79,2 to 97,6
5	-5 to 5	95-105	2,2 to 2,75	97,6 to 116
6	5 to 15	105-115	2,75 to 3,3	116 to 134,4
7	15 to 25	115-125	3,3 to 3,85	134,4 to 152,8
8	25 to 35	125-135	3,85 to 4,4	152,8 to 171,2
9	> 35	> 135	4,4 to 5	171,2 to 190

The calculation of each index is based on the summing up of the values of the class of the individual indicators, assuming equal weight for each of the indicators that make up the index. The basic assumption is that the higher the value from the EU average the better the value of the index for the geographical areas. Therefore, when the indicator expresses a negative issue, such as the percentage of unemployment, the value of the class was inversed, i.e. if the value was 9 it becomes 1, if it was 8 it becomes 2, etc. Thus, the value of the index is always 'positive' and expresses how 'better' or 'worse' the state, the change or the attractiveness of the areas discussed are compared to the EU average and the average values of the member states with islands (except for the case of the first attractiveness index where the comparison is with the average value of the range of the values of the indicators).

The geographical areas that are considered for the calculation of the indexes include all types of NUTS areas:

1. EU27
2. NUTS 0: Member states with islands as statistical units (NUTS 2 and 3); 11 in total:
  - I. Cyprus (CY) island state
  - II. Denmark (DK)
  - III. Estonia (EE)
  - IV. Spain (ES)
  - V. Finland (FI)
  - VI. France (FR)
  - VII. Greece (GR)
  - VIII. Italy (IT)
  - IX. Malta (MT) island state

- X. Sweden (SE)
  - XI. United Kingdom (UK)
3. NUTS 2: Island Regions or islands
    - I. Corse (FR83)
    - II. Ionian Islands (GR22)
    - III. North Aegean (GR41)
    - IV. South Aegean (GR42)
    - V. Crete (GR43)
    - VI. Sicily (ITG1)
    - VII. Sardegna (ITG2)
    - VIII. Åland (FI20)
    - IX. Illes Balears (ES53)
  4. NUTS 3: Island Regions or islands
    - I. Bornhom (DK014)
    - II. Mallorca (ES531)
    - III. Menorca (ES532)
    - IV. Eivissa y Formentera (ES533)
    - V. Zakynthos (GR221)
    - VI. Kerkira (GR222)
    - VII. Kefallinia (GR223)
    - VIII. Lefkada (GR224)
    - IX. Lesvos (GR411)
    - X. Chios (GR412)
    - XI. Samos (GR413)
    - XII. Kyklades (GR421)
    - XIII. Dodekanisos (GR422)
    - XIV. Malta (MT001)
    - XV. Gozo (MT002)
    - XVI. Gotland (SE214)
    - XVII. Island of Wight (UKJ34)
    - XVIII. Eilean Siar (Western Isles) UKM64
    - XIX. Orkney Islands UKM65
    - XX. Shetland Islands UKM66

Some of the above islands are included in more than one NUTS level. Malta is such a case, which is both a Member State (along with Gozo) and a NUTS 3 area, separate from Gozo. Greek islands are another case where the NUTS 2 areas GR22, GR41 and GR42 have many islands, but are considered as a single unit, while the NUTS 3 divisions also have typically more than one island (12 for GR422, 20 for GR421, etc.). When data are available for both NUTS 2 and NUTS3 level for the same geographical area, only the NUTS3 data are included in the calculation of the index in order to avoid double counting.

Cyprus and Malta are included two times in the calculation of the indexes: within the calculation of the member-states average, but also in the calculation of the islands' average.

The variables selected for the creation of indexes are chosen between the variables used for the analysis of each topic as it is presented previously (paragraphs 2.1.1 and 2.1.2); the availability of data and the degree of correlation between them was two more determinative factors for the final selection.

The **State** index is calculated twice with the use of four and five indicators:

- (a) GDP per capita 2006 (EU 27=100);
- (b) The active population / total population % that is first transformed with the EU27=100 and then the classes are assigned to the values;
- (c) The unemployment rate % in 2008 that is first transformed with the EU27=100 and then the classes are inverted to keep the overall scale of the values of the indicator already discussed above;
- (d) The percentage of population older than 65 in 2007, which is first transformed with the EU27=100 and then the classes are inverted to keep the overall scale of the values of the indicator already discussed above.
- (e) The percentage of artificial land to the total land from the CORINE data base in 2000, with the EU27=100 and then the classes are inverted.

The State Index is used not only to compare islands with EU average but also for the classification of islands into groups.

The **Change** index covers the period 2000 – 2006 and is calculated with the use of three indicators:

- (a) population change 2000 - 2006 % that is first transformed with the EU27=100 and then the classes are assigned;
- (b) The GDP per capita with the EU27=100 change % 2000 - 2006, where the classes are assigned to the values;
- (c) The active population change % 2000-2006, which is first transformed with the EU27=100 and then the values of the indicator are assigned.

As it is mentioned previously "since regional attractiveness has been explored in previous EU studies (mainly in Economic and Social Cohesion and ESPON 2006 reports) a lot of parameters have already been identified: Lisbon performance, labour market, accessibility and hazards are among the most important". From



these variables used for the analysis of attractiveness, the most representative are selected for the construction of the indexes; the availability of data for the NUTS 2/3 regions is another parameter for the final selection.

The first **Attractiveness** index (**Attractiveness Direct Index**) is calculated with the use of two indicators:

- (a) The average FUA value for which the classes are assigned according to the method laid down in Table S9;
- (b) The ESPON multimodal accessibility indicator for which the classes are assigned according to the method laid down in Table S9;

These two indicators are selected among all attractiveness parameters as the most representative indicators of insularity influencing directly their attractiveness: the first records the differences of dynamism between cities based on their population size and their functions; the second records the difference of accessibility between the European territories, islands included.

The second **Attractiveness** index (**Attractiveness Indirect Index**) is calculated with the use of five indicators:

- (a) The percentage of population with low education level % of the population in 2008 that is first transformed with the EU27=100 and then the classes are assigned and reversed;
- (b) Research and Development % of the GDP in 2008 that is first transformed with the EU27=100 and then the classes are assigned (data for NUTS 2 areas refer to 2007);
- (c) The percentage of households with broadband access % of the total number of households in 2008, which is first transformed with the EU27=100 and then the values of the indicator are assigned;
- (d) The unemployment rate for the group 15 to 24 years old in 2008, which is first transformed with the EU27=100 and then the classes are assigned and reversed;
- (e) The governance indicator is based on quantitative and qualitative data produced by the ESPON 2006, "Governance of Territorial and Urban Policies from EU to local level", as number of public employes, national governance patterns, sift from government to governance, state structure and process etc.

These five indicators are selected among the attractiveness parameters that are related to "Lisbon Strategy". As for these indicators data are available typically at NUTS 2 level and therefore the Index is calculated only for NUTS 2 level.

The third **Attractiveness** index (**Attractiveness Assets Index**) is calculated with the use of two indicators (data from the ESPON DataBase) in order to evaluate the islands' potential:

- (a) The share of Natura 2000 area on the total area of the islands region (ESPON 2006, Territorial Trends of the Management of the Natural Heritage (Project 1.3.2));
- (b) The density of cultural monuments of the island regions as estimated by ESPON 2006, The role and the spatial effects of Cultural Heritage and Identity (Project 1.3.3).

The values of all indicators are presented and discussed in the next section of the report (3.3).

#### 2.1.5. A typology of Islands

*"ESPON typologies provide a special view of the ESPON area allowing to identify regional characters and to analyse the causes of their differences. In addition to simple benchmarking the typologies show the regional setting with regard to the selected thematic orientation. They provide the conceptual analytical tool to describe territorial structures on the basis of indicators derived which could be used for further investigations with regard to other spatial structures and developments". (ESPON, Monitoring Territorial Development, p.13)*

The types of data that we need to statistically analyze in this project require the employment of multivariate methods. There are several motivations for this. We have to search for the pattern of relationships between many variables simultaneously. Complex interrelationships will not allow a useful analysis to be obtained by using each variable in isolation. The main motivations are:

- Classification – dividing variables or samples of islands into groups with shared properties.
- Identifying gradients, trends or other patterns in island multivariate data.
- Identifying which explanatory, independent or environmental (if any) variables are most influential in determining sample structure.
- Finally and perhaps most importantly, we will aim to distil the most important features from the sets of the complex island data, so that these can be presented clearly to policy makers and stakeholders. This often entails displaying the main features in a 2- or 3-dimensional plot.

Our data set will comprise a number of samples, cases or observations. For each sample there will be values for a number of variables.

The methods used in this analysis can be applied to the following types of variable record:

- Quantitative measures – e.g. population sizes
- Semi-quantitative measures – e.g. densities on a scale 1 to 5, or perceived attractiveness on a scale 1 to 10.
- Binary or presence/absence records – e.g. a facility or other object has a score of 1 if present in a sample and zero if not.

Data may be transformed if necessary to avoid high magnitude variables dominating the analysis. At the same time variables will be examined for their correlation between them. “Duplicated” (highly correlated) variables will be removed from the analysis to decrease the volume of data.

### **Multivariate methods**

The types of data that we needed to statistically analyze in this project required the employment of multivariate methods. There were several motivations for this. We had to search for the pattern of relationships between many variables simultaneously. Complex interrelationships did not allow a useful analysis to be obtained by using each variable in isolation. The main motivations were:

- Classification – dividing variables or samples of islands into groups with shared properties.
- Identifying gradients, trends or other patterns in island multivariate data.
- Identifying which explanatory, independent or environmental (if any) variables were most influential in determining sample structure.
- Finally and perhaps most importantly, we aimed to distil the most important features from the sets of the complex island data, so that these can be presented clearly to policy makers and stakeholders. This often entails displaying the main features in a 2- or 3-dimensional plot.

Our data set comprised a number of samples, cases or observations. For each sample there were values for a number of variables.

For the classification of islands the following methods are used.

### Principal component analysis

Principal component analysis is appropriate when you have obtained measures on a number of observed variables and wish to develop a smaller number of artificial variables (called principal components) that will account for most of the variance in the observed variables. Technically, a **principal component** can be defined as a linear combination of optimally-weighted observed variables. The principal components may then be used as predictor or criterion variables in subsequent analyses.

The first component extracted in a principal component analysis accounts for a maximal amount of total variance in the observed variables. Under typical conditions, this means that the first component will be correlated with at least some of the observed variables. It may be correlated with many.

The second component extracted will have two important characteristics. First, this component will account for a maximal amount of variance in the data set that was not accounted for by the first component. Again under typical conditions, this means that the second component will be correlated with some of the observed variables that did not display strong correlations with component 1. The second characteristic of the second component is that it will be *uncorrelated* with the first component.

In this project, the method was used to aid graphical identification of grouping of data.

### Discriminant analysis

The main purpose of a discriminant function analysis is to predict group membership based on a linear combination of the interval variables. The procedure begins with a set of observations where both group membership and the values of the interval variables are known. The end result of the procedure is a model that allows prediction of group membership when only the interval variables are known. A second purpose of discriminant function analysis is an understanding of the data set, as a careful examination of the prediction model that results from the procedure can give insight into the relationship between group membership and the variables used to predict group membership.

In this project, the method was used to check whether the objects in different groups identified by the previous method were correctly assigned into these groups and whether the groups were statistically different.

The findings are presented in the section 3.4.

## ***2.2. Methods for the Islands' Impact Assessment***

### ***2.2.1 The Approach***

The purpose of the suggested analysis is to evaluate how existing policies have affected territorial aspects of the islands' development and more precisely the parameters influencing islands' attractiveness. Since the islands' socioeconomic conditions and their respective political and administrative structures vary considerably the proposed analysis will steer clear of attempting to deliver a complete or detailed account of every single policy measure and the effects which this may have caused. A more detailed analysis would be overly extensive and cannot be completed within the proposed project. The basic idea of this part of the analysis is, therefore, to flesh out the most significant programme theories which either form the underlying basis of various policies or programmes or which exist implicitly within a particular policy. This means that the proposed analysis needs to state the basic principles of the policies or in, some sense, reconstruct the manner in which the policies are supposed to operate. This approach follows an important line in modern evaluation theory (Pawson and Tilley, 1997) and the concept of territorial impact assessment as outlined in *Applied Territorial Research* (ESPON scientific report, 2006). The advantage of adopting the approach which focuses on programming theories is that the individual circumstances of the islands selected for the case studies end up having less importance. Instead, the focus will shift towards the way in which the programme theories work under specific conditions influencing attractiveness parameters. Additionally, conclusions will be drawn regarding the theories' causal effects in isolation from various mediating factors (islands' socio-economic and environmental parameters), including the administrative context. These factors have to be integrated into the analysis through islands' typology in order to see if there are different results under different situations. The following policy areas have been selected because they are assumed to be central in terms of addressing the special features of the islands' territorial situation. Even though five policies may seem like an extremely limited selection, the chosen policies are comprehensive, meaning the analysis will be extremely detailed.

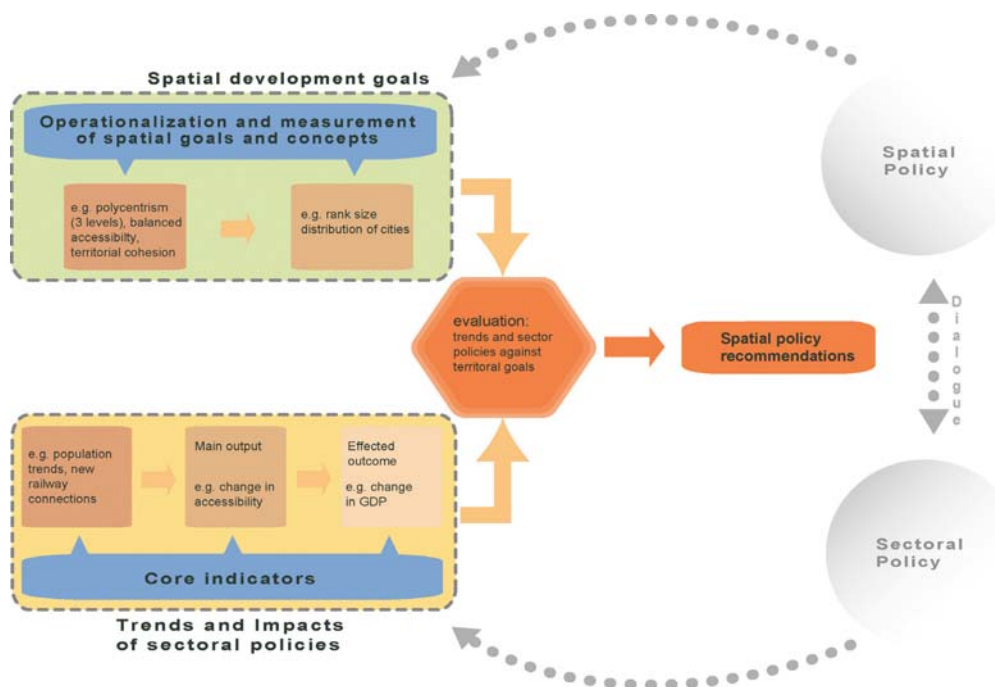
As the focus is on programme theories or mechanisms the analysis will be of use to the stakeholders, not only because it concerns vital policy areas, but also because the method will help to inform these stakeholders about how different sector policies depend on the same mechanisms. This supports the ambition from ESPON to encourage "evidence-informed policy rather than evidence-based policy" (ESPON, 2006, p.18). The policy areas the study will focus

at are: (a) Structural funds policy; (b) Enforcement of entrepreneurial initiatives; (c) Management and valorization of natural and cultural resources (Common Agriculture policy, Fisheries and Maritime Policy, environmental policy); (d) Enhancement of human resources; and (e) Services of public interest.

The idea is to contrast the European policy initiatives with the national policies and especially to make an evaluation of the different apparent governance models. The first area relating to general regional development policy is evident as a key evaluation area as a growing number of islands are not any more receiving financial support from EU budget. Policies related with the creation and the support of enterprises as the system of European and national aids and the innovation policy are considered of high priority from the stakeholders, as the maintenance of economic activity on the islands is under continues pressure especially due to globalization. The preservation of natural and cultural assets, comparative advantage for islands' attractiveness has to be examined in combination with policies as the Common Agriculture Policy, the Common Fisheries Policy, the Maritime Policy and the Environment Policy. Policies related to Services of Public Interest as Transport, Communication, Education, Health are also a central issue for the islands. Possible additions of policy areas will come from a survey that will be distributed to the central policy makers on the islands, in order to examine whether more policies should be included in the analysis and which ones they consider the most important for the islands in relation to territorial cohesion. The aim of the survey is to give a picture of the diversified field of policies the analysis should be relevant for and to fix the list of policies that are going to be evaluated.

The purpose of this analysis is, using the outcomes from the evaluation of existing policies, to propose adequate policies that can affect territorial aspects of the islands' attractiveness. As ESPON's scientific report (p.17) underlined "the link between territorial policy aims and objectives with territorial trends, perspectives and policy impacts within the applied research of ESPON has been guided by an approach that can be illustrated with the following figure. In summary, the figure shows an approach to the analysis where the main scientific tasks are (1) to operationalise the policy aims, objectives and concepts; (2) make them measurable and find indicators and data describing territorial development trends and policy impacts; and (3) compare and evaluate the empirical findings against the background of the territorial policy aims and objectives".

Figure S2.3. Basic methodological approach for Policy proposals



Source: ESPON, Crete Guidance Paper, June 2006

As spatial policy recommendations have to focus on how to maximize islands' attractiveness, our task is to work on sectoral policies that have major influence on the parameters already investigated. ESPON's Territorial Impact Assessment (TIA) was used and The Island Impact Assessment (IIA) was based on the use of an expanded DPSIR framework that will include socioeconomic and environmental issues as it is presented in figure S2.3.

### 2.2.2. Guidelines for the ex-post impact assessment

The aim of these guidelines are to describe the framework for the Island Impact Assessment, which is going to be used and tested in the case studies of EU-policies on different islands.

The guide is based on ESPON work on territorial impact assessment and the literature on programme evaluation. The most important implication from this literature is that the assessment has to be based on the **programme theory** or the theory of action which a policy, a programme or a project draws on (explicit or implicit). The rationale for the method is to highlight if the policies function as expected. This directs the attention toward the main concerns of the policy and in this analysis, how the policy impact islands<sup>10</sup>.

<sup>10</sup> Compared to the general economic modelling approach of for example the TIP-TAP the method of this project focus on **how** the specific causal link between policy and impact is constituted in the relevant (island) context (a more detailed critique/discussion of TIP-TAP is probably needed).

The assessment carried out in this study is **retrospective** and is based on available data. Some impact assessments (mostly economic assessments based on some sort of cost-benefit analysis) are carried out ex-ante. The strength of retrospective (ex post) analysis is the opportunity to analyse the policy as it actually has been implemented with all the changes in the policies due to problems and limitations in the context.

The central question for the guide is how the **impact** of an EU-**policy** in a specific **context** of an **island** is **assessed**.

The guide requires that the case studies as a minimum have to specify the following:

1. How is the **policy** defined?
2. What is the **programme theory** of the policy?
3. How can the **context** of the policy be specified?
4. How is the impact of the policy **measured**?
5. An **analysis** of the impact indicators.
6. A **conclusion** on the impact of the policy.

#### How is the policy defined?

- Clarify and delimit the policy and policy measures which are going to be analysed in the IIA.
- The delimitation of the policy comprises time and space as well as objectives, scope and the processes of implementation.
- For most policies, this delimitation must be done in a conceptual way with regard to objectives and processes, but in some cases a single or a few projects can be argued to be good representations of policy implementation on an island.
- Since the territorial element of the policies is paramount in this analysis; it is important to discuss how the question of territory is addressed in the policy.
- When discussing the elements of the policy it is important to specify the means of the policy in terms of financial funds as well as to specify the processes in place to allocate the funds and to control projects.
- Finally the output of the policy has to be described.

#### What is the programme theory (theory of action) of the policy?

- What is the idea of the causal relationship in the policy?
- Which factors (output) are supposed to influence (results and impact) other factors?
- Specify the territorial effects anticipated in the policy, especially the effects relevant to islands.



- On the basis of theoretical considerations, specify other territorial effects (intended or unintended) which can be expected from the policy.
- Summarize the main points of the theories, which are relevant to test in order to find out how the policies impact islands (compared to other territories).

How can the context of the policy be specified?

- The context of the policy has to be specified to make it possible to assess how the programme theory is expected to function on islands (or the specific island) compared to other places where the policy is implemented.
- The specification of context also has to address the structure and culture of the political and administrative system the islands of the case studies are subjected to.
- This analysis of context should be condensed in some major points which are used in the following points in the analysis.

How is the results and the impacts of the policy measured?

- On the basis of the specification of the programme theory, it has to be determined which indicators best reflect the result and the impact of the policy under examination. The indicators ideally have to be chosen with regard to points crucial for the function of the programme theory and not because the data happens to be available. The variables chosen for this project are already used in the state and the attractiveness analysis (Table S10).
- The data used for the indicators can therefore include quantitative as well as qualitative information, depending on the type of policy analysed. Based on this argument there will be no common set of indicators used indiscriminately across islands and policies. The choice of indicators will rest on an analysis of the particular policy in question.
- For similar reasons, the methods used in the policy impact assessment have to be considered with regard to the data needed for an evaluation of the policy impact. The limited possibilities for the case studies to involve research on the ground indicate that data will be from existing studies. The case studies have to make clear when other (not available) data would be preferable.
- Earlier ESPON studies should be used as reference material to refine the discussion of data and methods.

Analysis of the result and impact indicators

- On basis of the programme theory and the indicators described in the previous parts of the study the policy is analyzed and synthesized to assess the result and the impact of the policy and the limitations of the analysis.

*Conclusion on the results and impact of the policy*

- One part of the conclusion should focus on the results of a policy, how it has addressed the attractiveness problems of the islands.
- The other part of the conclusion should focus on the impacts of a policy how it has addressed the sustainability problems of the islands.

Island Impact Assessment (IIA) has to follow the general guidelines and steps<sup>11</sup> already formulated in other studies in order to use the existing information from previous analysis and to give comparable results. **But IIA has to introduce in the analysis – specifically in the designation of cause-effect relations- the specific characteristics of the islands. As it has already been mentioned these characteristics are influencing the attractiveness of the islands (cause of the problems) and also they are indirectly affecting islands’ sustainability state.** So it is important to introduce these relationships into the analysis. The integration of the attractiveness and sustainability parameters is met through our conceptual framework (Figure 1) all along this study and the variables that are considered as critical are used for the calculation of the Attractiveness and the State Indexes; **within this approach in order to consider the policies as efficient for islands, their results have to modify in the short term the attractiveness parameters and to influence its sustainability parameters in the mid- and long term** (Table S10). The modification of the different variables and indicators can be positive (+1 up to +3) or negative (-1 up to -3); by zero it is mentioned the absence of modification or the absence of direct relation.

During the evaluation of the results and the impact of the different policies any confusion between outputs and results or impacts of a policy has to be avoided; every policy has outputs, but its results and impacts has to be assessed regarding the positive or negative modification of attractiveness and state variables and indicators. The score can fluctuate from -3 (for very negative results or impacts) to +3 (for very positive ones) or to be just the appreciation “positive” or “negative”.

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<sup>11</sup> As they are formulated by ESPON progress on Territorial Impact Assessment (TIA), (29 January 2009, p.7) and by TIPTAP final report (p.6-12).

Table S10 Attractiveness (Result) and Sustainability (Impact)  
Parameters and Indicators

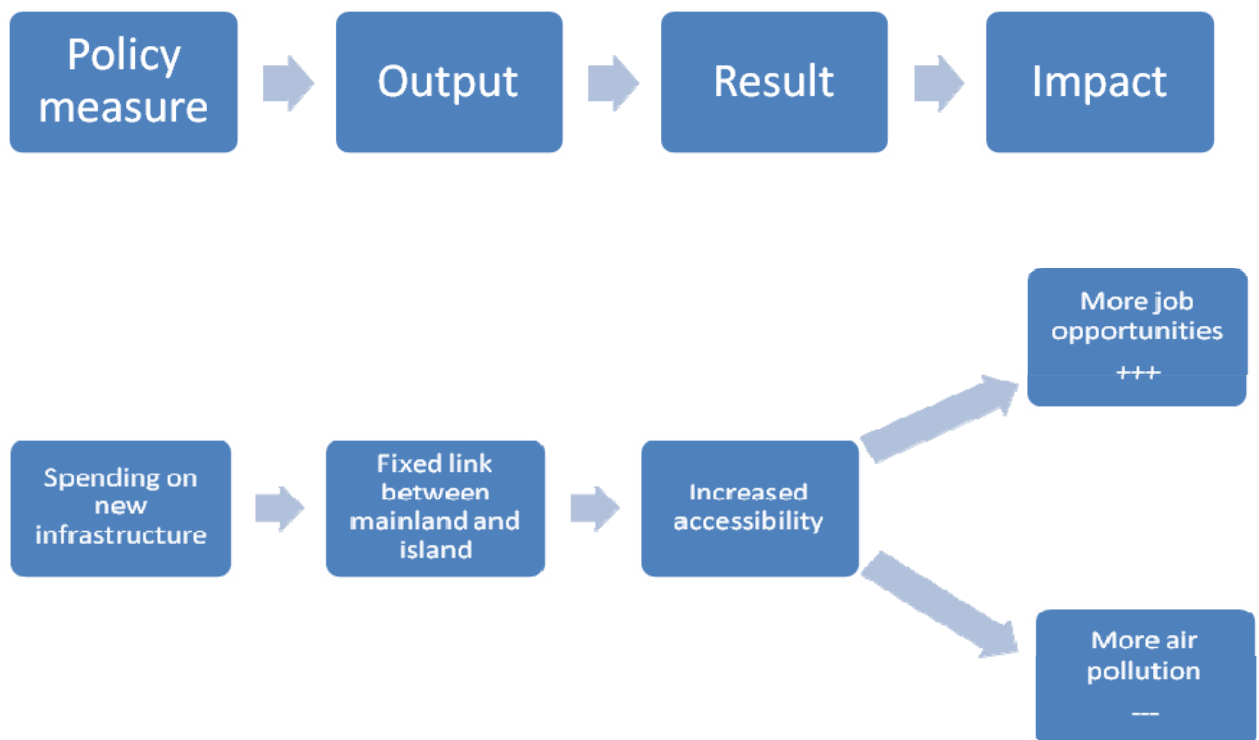
A. ATTRACTIVENESS PARAMETERS AND VARIABLES-INDICATORS		
PARAMETERS	VARIABLES - INDICATORS	SCORE
Accessibility	<ul style="list-style-type: none"> <li>- Amelioration of transport infrastructure</li> <li>- Frequency of services</li> <li>- Cost of travel</li> </ul>	
Public Interest Services (Energy)	<ul style="list-style-type: none"> <li>- Amelioration of infrastructure</li> <li>- Quality and Cost of services</li> <li>- Amelioration of efficiency (production and consumption)</li> <li>- % of Renewable Energy</li> </ul>	
Agglomeration economies / competitiveness	<ul style="list-style-type: none"> <li>- Services to enterprises and population financed by the state/local government</li> <li>- Competitiveness incentives for business</li> </ul>	
Environmental and Cultural Heritage	<ul style="list-style-type: none"> <li>- % of Natura 2000 zones</li> <li>- % of waste water treated</li> <li>- % of recycled waste material</li> <li>- CO2 Production</li> <li>- Cultural sites protected and exploited</li> <li>- % of employment in cultural activities</li> <li>- Creation of cultural amenities/infrastructures</li> </ul>	
Feeling of Safety - Security	<ul style="list-style-type: none"> <li>- Criminality change</li> </ul>	
Natural and Technical Hazards	<ul style="list-style-type: none"> <li>- Forest fire prevention and coping</li> <li>- Floods prevention</li> <li>- Pollution prevention</li> <li>- Tsunamis prevention and coping</li> </ul>	
Labour qualifications	<ul style="list-style-type: none"> <li>- Educational attainment level</li> <li>- Lifelong learning / New skills creation for entrepreneurs, employees, unemployed, young, women</li> </ul>	
Information society penetration	<ul style="list-style-type: none"> <li>- Broadband Access</li> <li>- Use of Internet</li> <li>- E-commerce</li> </ul>	
Research and innovation	<ul style="list-style-type: none"> <li>- % GDP dedicated to R&amp;D</li> <li>- Existence of R&amp;D structure</li> </ul>	
Social Capital	<ul style="list-style-type: none"> <li>- Social networks</li> <li>- NGO action</li> <li>- Coping for Hazards Confrontation</li> </ul>	
Governance Quality	<ul style="list-style-type: none"> <li>- Existence of Local Vision-Strategy-Plan</li> <li>- Level of participation of stakeholders in vision and strategy creation, planning and decision making</li> </ul>	

	<ul style="list-style-type: none"> <li>- Existence and Performance of Structures Supporting Entrepreneurship (Development Agency, Technology and Innovation Center...)</li> <li>- Transborder / transregional cooperation projects</li> <li>- Cope with social problems (poverty, exclusion....)</li> </ul>	
Employment opportunities	<ul style="list-style-type: none"> <li>- % of young unemployment change</li> <li>- % of long term unemployment change</li> <li>- % of active population change</li> <li>- % of women active population change</li> </ul>	

B) SUSTAINABILITY PARAMETERS AND INDICATORS		
Parameters	Indicators	Scoring
Economic effectiveness	<ul style="list-style-type: none"> <li>➤ GDP &amp; GDP per capita evolution - GDP per capita convergence</li> <li>➤ Structure of the economy GVA (share of competitive activities, share of principal activity)</li> <li>➤ Employment evolution</li> </ul>	
Social cohesion	<ul style="list-style-type: none"> <li>➤ Population evolution</li> <li>➤ Age structure / % of population +65 years</li> <li>➤ Active population rate %</li> <li>➤ Unemployment rate</li> <li>➤ At Risk of Poverty</li> </ul>	
Environmental conservation	<ul style="list-style-type: none"> <li>➤ % of artificial land</li> <li>➤ Fresh water availability</li> <li>➤ 20/20/20 objective</li> </ul>	

It has to be mentioned that every policy probably affects directly one or more attractiveness parameters but not all of them; for instance the amelioration of the transport infrastructure (policy output) affects the Accessibility (result) of an island (but not other parameters as Labor Qualification or R&D) and has an impact to employment and air quality (impact) (Figure S2.3).

Figure S2.3: Causal link between a policy measure, output, result and impact



**Another critical point of the IIA, related to the previous topic, concerns the weighting of the parameters;** in the TIPTAP project it has been used a mix system – from “above” (experts) and from “below” (end users) – in order to weight the parameters. In Euroislands, the State and Attractiveness Indexes are calculated without any weighting. This has led to the following “de facto” weighting of the sustainability parameters in the State Index: economic performance (2 variables) 40%, social equity (2 variables) 40%, and environmental conservation (1 variable) 20%. Concerning the Attractiveness Indexes, input from the Delphi Method (using the opinion stakeholders and experts) could be used if a global attractiveness index could be calculated as both groups have given different importance to the diverse parameters; **the Services of General Interest – mainly transport, energy and health – were very highly ranked from both groups.** The weighting of factors that will be finally adopted has to remain stable independently the policy assessed.

Finally, an important point within the assessment of the policies is that it has to compare their results in islands with the results in other areas of the European mainland, mainly the central ones in order to see if there is any improvement

**“filling the gap” between them.** This can be done through the attractiveness and state indicators that are used in this project. For instance, it is important to know if the Transport Policy is contributing to fill the accessibility gap of the island’s regions in comparison with other regions and not only if there is an amelioration of the accessibility in islands in absolute terms; or if CAP is assisting sufficiently the small exploitations in remote less favorite areas as islands compared to the big exploitations of the European plains in order to continue to produce (creating GDP and employment) and to maintain the environmental equilibrium of these zones contributing in this way to their sustainability.

### 2.3. Information System

All activities concerning variables and indicators storage, geographic data manipulation, metadata management, thematic map production and dissemination of project results, were supported by a multi-part information system, hosted at a server of the leader partner.

The information system is composed of the following parts, as depicted in Figure S2.4: (a) the web-site (portal) of the project, (b) the metadata catalogue, (c) the web-based geographic information system (webGIS), and (d) the database.

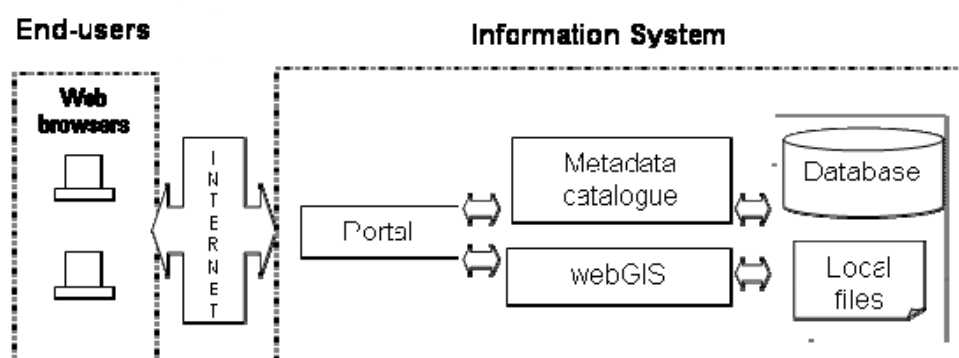


Figure S2.4: The parts of the information system

The distinct parts of the information systems are briefly presented in the following paragraphs, while a more technical description is provided in section 2.3.6 (Technical Description).

#### 2.3.1. Portal

The website (portal) is the central point for the dissemination of all information (such as announcements, reports, presentations, etc.) regarding the project, for the provision of all services (metadata catalogue searching, interactive thematic maps viewing) and for

hosting the electronic ATLAS of the European Islands (project's study area). In addition, the portal supports an on-line discussion group (island's forum), although it wasn't utilized by the project partners. The current URL for the portal is:

<http://geo-ellanikos.aegean.gr/ESPON>



Figure S2.5: The home page of the portal

From the Main Menu included in the home page of the portal (Figures S2.5 and 2.6), the end-user is able to access all information regarding the project, the islands' forum, the electronic ATLAS, the metadata catalogue and the webGIS.



Figure S2.6: The Main Menu

## ATLAS

The ATLAS contains the thematic maps created to visualize the results of the project (Figure S2.7). The end-user is able to select the desired map, to view it in full and/or to download it.

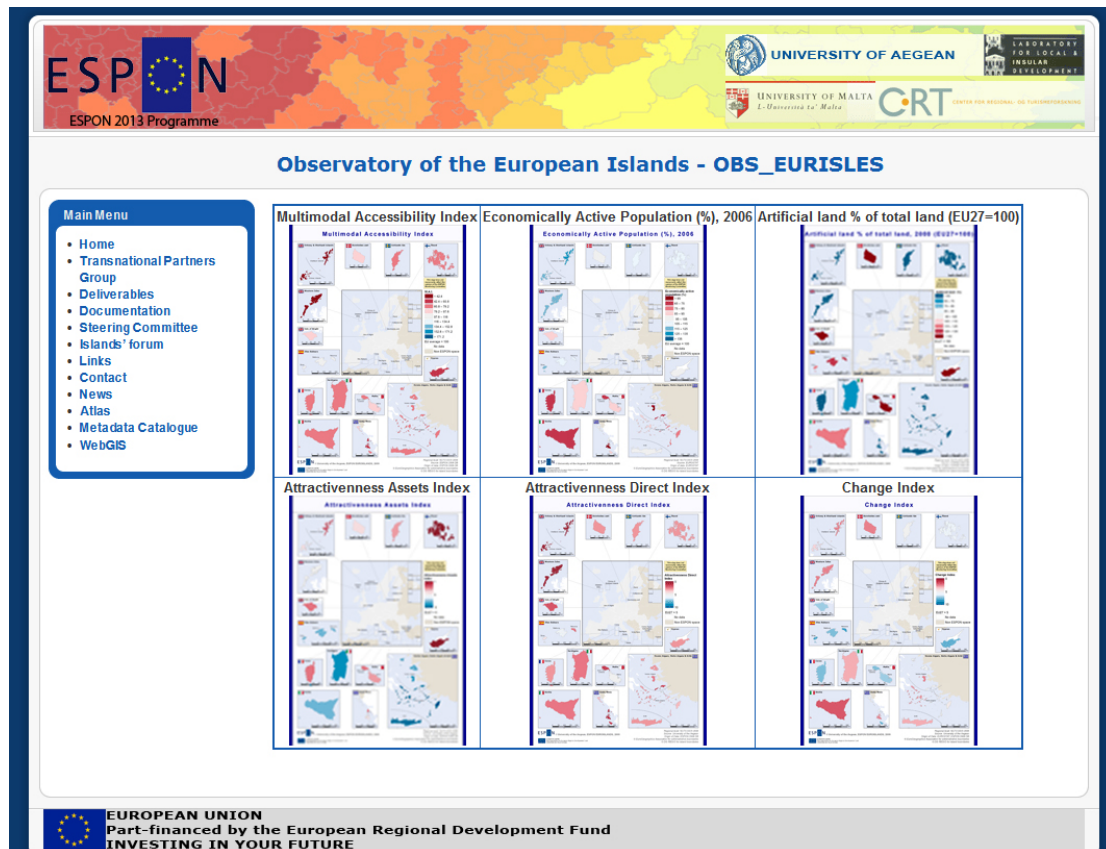


Figure S2.7: The ATLAS

### 2.3.2. Metadata Catalogue

Every dataset stored in the database is accompanied with the appropriate metadata record, according to the ISO 19115 standard. Metadata records are managed by a metadata catalogue system, supporting the unified searching of data (either in the database or the file system). End-users are able to specify searching criteria (Figure S2.8), to get the results list and to inspect each returned dataset (view the whole metadata record and/or view the corresponding thematic map using the webGIS).



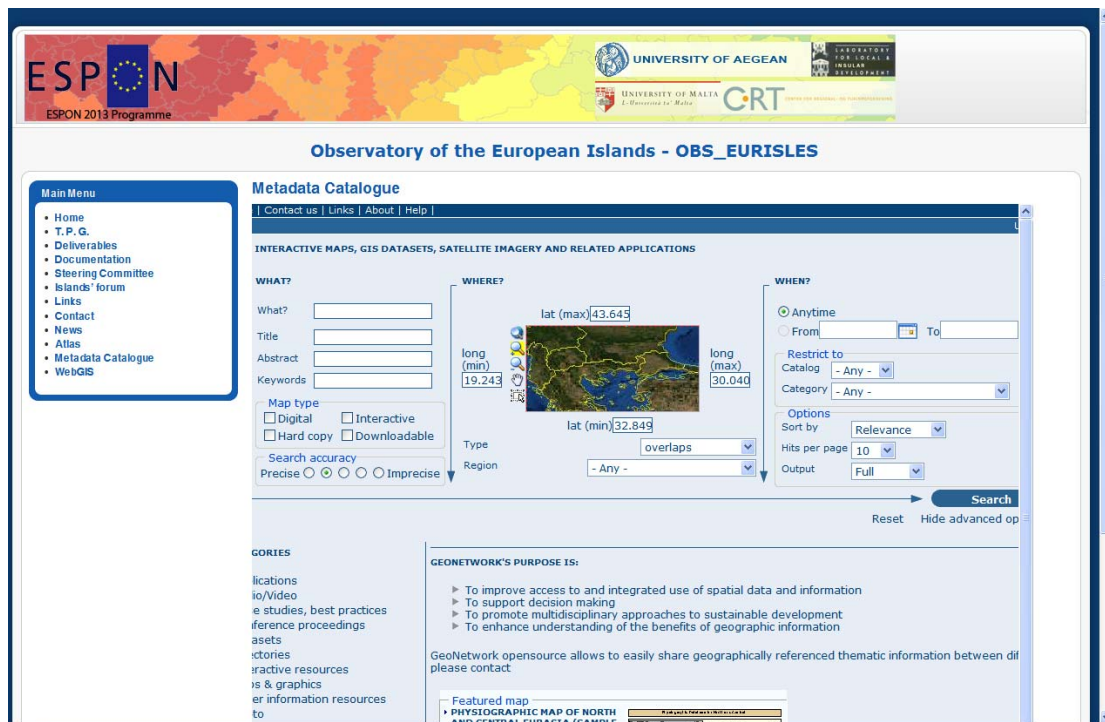


Figure S2.8: Metadata catalogue searching interface

### 2.3.3. webGIS

A specific web-based geographic information system (webGIS) is developed to support end-users interaction with the project results. Specifically, the webGIS provides on-line interactive thematic maps, depicting the indicators produced during the project. The end-user is able to select both the desired indicator from the *variables* section and the classification method (equal ranges, equal count or Jenks) from the *classification options* section.

For better visualization of the territory of the islands of the study area in relation to the European continent, the interface of the webGIS is composed of nine map areas (instead of one, as is usual for mapping applications), all sharing a single table of contents and legend area (Figure S2.9). The interface provides only a limited set of cartographic or screen management operations, in accordance with its aim to just support the visualization of project results.

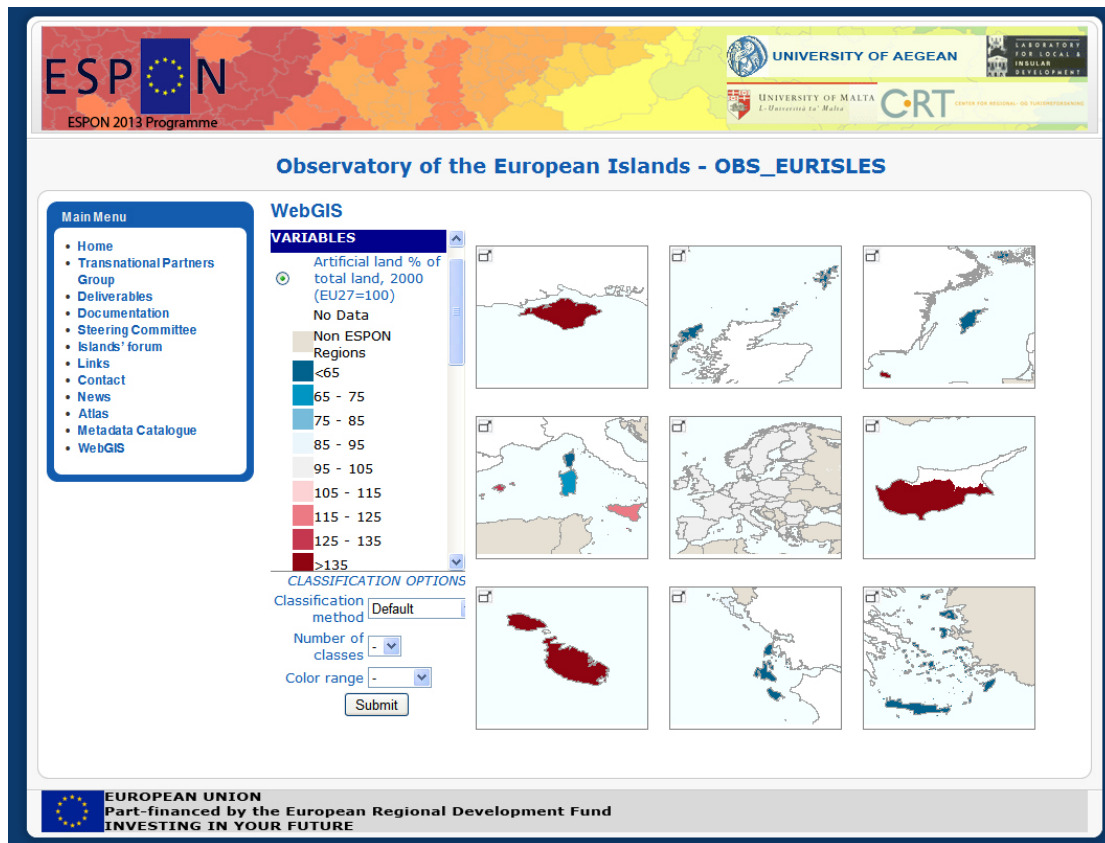


Figure S2.9: The webGIS interface

#### 2.3.4. Database

All variables and indicators (offered by other ESPON projects, collected from the EU or the stakeholders, or produced during this project), as well as all spatial data (administrative data, or data collected during the case studies), are stored in a single central database, hosted at a server of the leader partner. Additional kinds of data, such as raster-nature resources, are stored in the file system of the same server. The design of the database (Figure S2.10) is compatible to the schema of the *ESPON Database*, as described in the ESPON DATABASE 2013 Technical Report “ESPON DATABASE APPLICATION”, in order to facilitate the data import/export procedures.

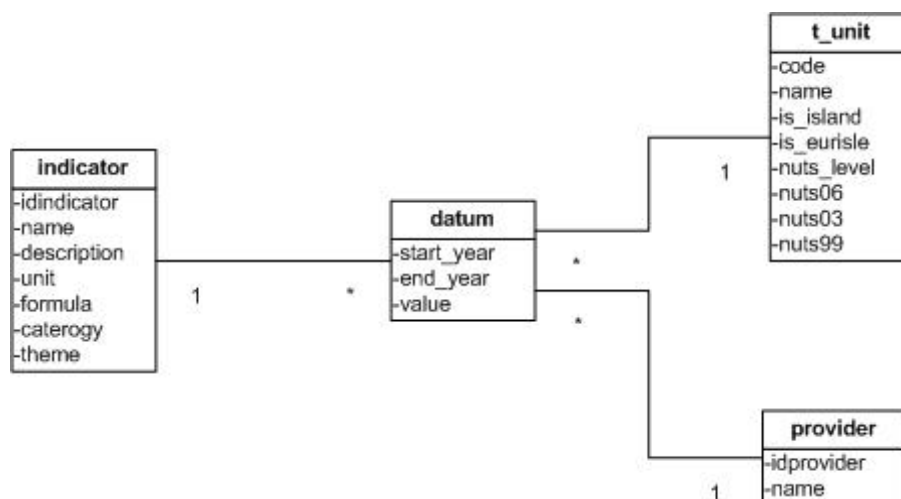


Figure S2.10: UML class diagram of the database

The following tables analyze the database design.

Class:	<b>indicator</b>	
Description:	The variables or indicators used/produced during the project	
Attributes:	idindicator	A serial number (key)
	name	The name of the indicator
	description	The description of the indicator
	unit	The measurement units
	formula	The calculation formula of the indicator (if applicable)
	category	The thematic category of the indicator
	theme	The thematic sub-category of the indicator
Class:	<b>t_unit</b>	
Description:	The territorial units for which data are collected/used/produced during the project	
Attributes:	code	Code value, usually NUTS code (key)
	name	The name of the territorial unit
	is_island	An indication if the territorial unit is an island
	is_eurisle	An indication if the territorial unit belongs to the study area of the project
	nuts_level	The NUTS level of the territorial unit (0, 1, 2, 3)
	nuts06	The NUTS code of the territorial unit in the 2006 NUTS version
	nuts03	The NUTS code of the territorial unit in the 2003 NUTS version
	nuts99	The NUTS code of the territorial unit in the 1999 NUTS version
Class:	<b>provider</b>	
Description:	The providers of the data collected/used/produced during the project	

Attributes:	idprovider	A serial number (key)
	name	The name of the provider

Class: **datum**

Description: Single values for indicators, according to specific spatial and temporal limits

Attributes:	start_year	The starting year of the dataset
	end_year	The ending year of the dataset
	value	The value of the indicator

There are three binary (one-to-many) relationships connecting the datum class to the other three, in order to relate every value to the appropriate indicator, spatial scope and provider.

### *2.3.5. Omissions*

Although the initial intention was the values of the indicators to be calculated interactively by the webGIS, based on primary variables stored in the database, this functionality wasn't implemented. The reason for this omission was the fact there are no available comparative/compatible primary variables at the island level or even at the same NUTS II-NUTS III level. So, it was turned out that the calculation of project indicators (such as the Island Impact Assessment) is a more qualitative rather than quantitative process.

For the same reason (i.e., no availability of data at the island level), the NUTS-island classification was not implemented. Instead, an indicator for islands was included in the database records of the territories.

Finally, a number of initially specified cartographic operations were not implemented in the webGIS, because there were unnecessary after the splitting of the study area to nine inter-related mapping applications, or taking account the limited scope of the application to just support the visualization of the thematic maps.

### *2.3.6. Technical Description*

From a technical point of view, the information system is based on 3-tier architecture: (a) the user layer, (b) the application layer and (c) the data layer (Figure S2.11).

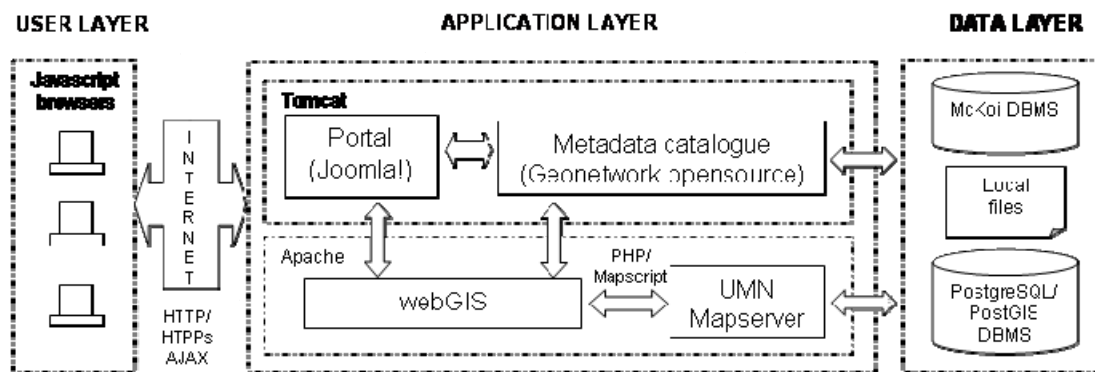


Figure S2.11: The architecture of the information system

End-users (user layer) interact with the information system (application layer) through Javascript-based web-browsers (MS Internet Explorer, Mozilla Firefox, etc.). The application layer consists of three parts:

- (i) **The website (portal)**, which provides general information and the results of the project, the electronic ATLAS, and links to the applications developed (services). The portal is developed using the *Joomla!*<sup>12</sup> Content Management System (CMS), which is open source software.
- (ii) **The Metadata Catalogue**, which provides the metadata search/retrieve service (based on the *GeoNetwork opensource*<sup>13</sup> software). The ISO 19115 standard was adopted for the fulfilling of the metadata records.
- (iii) **The webGIS application**, which provides interactive access to the layers (thematic maps) that were created to visualize the project results. The webGIS is supported by the (open source) *UMN Mapserver*<sup>14</sup>, operating on the (open source) *Apache*<sup>15</sup> web server. The webGIS and the Mapserver interact via the PHP/MapScript API.

The data layer keeps all data and metadata of the project. All variables, indicators, geographic data and environmental data are stored in a *PostgreSQL/PostGIS*<sup>16</sup> (open source) database and local files. The metadata records are stored in a *McKoi*<sup>17</sup> database (included in the Geonetwork opensource distribution).

<sup>12</sup> <http://www.joomla.org/>

<sup>13</sup> <http://geonetwork-opensource.org/>

<sup>14</sup> <http://www.mapserver.org/>

<sup>15</sup> <http://www.apache.org/>

<sup>16</sup> <http://www.postgresql.org/>, <http://www.postgis.org/>

<sup>17</sup> <http://www.mckoi.com/>

### 3. Diagnosis, Trends and Findings

The target of this chapter is to achieve an in depth knowledge of islands' situation, an evaluation of the level of divergence of islands from the European average (with the use of input from 9 case studies), plus an analysis of the islands' future potential from a European perspective.

The European islands included in this study (Map 1) are very diverse in terms of the size of their population and the "importance" of this population within their national entities. A quite clear geographical distribution is evident: on the one hand, islands in north Europe are rather small, mainly close to the coast, and their population is a small part of the total national population (less than 1% except for Estonia); on the other hand, in the Mediterranean, more diverse cases are encountered: there are two island-states (Cyprus and Malta<sup>18</sup>), very big island-regions such as Sicilia, Sardegna, Kriti, Mallorca and Corse, as well as archipelagos and coastal islands. The ratio of these islands' population to the correspondent national total varies from 100% for the islands states to less than 2% for France. Greece and Italy are the non islands-states where islands have an important weight; 12% of their population lives on islands.

The overall analysis is influenced and limited by the available information and data that corresponds to the islands' administrative status: for islands-states such as Cyprus and Malta, all data are generally available; on the other hand, information on the islands at LAU 1 or lower level is not available at all at the European level, except for very few variables. In between, for islands that are characterized as NUTS 2 and 3 regions, the available information is not homogenous and very unequal. Therefore, different units and levels of analysis are used:

- for most indicators used, data is available only for NUTS 0 and 2 areas, which yields 11 areas;
- in the cases where information for all the NUTS 3 islands areas is available, 20 more areas are added. However, some of these areas overlap: "Malta-state" data (NUTS 0 area) is the sum of "Malta-island" and "Gozo-Comino" (NUTS 3 areas); "Illes Balears" is the sum of the 3 newly created NUTS 3 areas of "Mallorca", "Menorca", "Eivissa I Formentera"<sup>19</sup>; In Greece,

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<sup>18</sup> All references to Malta concern the Malta State (NUTS 0 level); when information is provided for the island of Malta (NUTS 3 level) there is explicit reference.

<sup>19</sup> Eivissa i Formentera are two different islands belonging to the same NUTS 3 zone which is part of the NUTS 2 zone Illes Balears.

“Notio Aigaio” (NUTS 2 area) is the sum of the 2 NUTS 3 areas “Kyklades” and “Dodecanisos”; “Voreio Aigaio” (NUTS 2 area) is divided in 3 NUTS 3 areas (“Lesvos”, “Samos” and “Chios”) and “Ionia Islands” (NUTS 2 area) in 4 NUTS 3 areas (“Zakynthos”, “Kerkyra”, “Lefkada” and “Kefallonia”). Finally, the islands of Kriti, Sicilia, Sardegna and Corse are taken into account only as entire island entities (NUTS 2 areas), even if they include NUTS 3 sub-divisions.

Map S1: The Study Area

### ESPON EUROISLANDS CASE STUDY AREAS



ESPON  
 European Union  
 Policy Instrument for the European Regional Development Fund  
 administered by the ERDF Authorities

Regional level: NUTS 0 2000  
 Source: University of the Aegean  
 © EuroGeographics Association for administrative boundaries  
 © DG REGIO for island boundaries

**Legend**

- Case study areas
- ESPON space outside study area
- Non ESPON space

The data used for the analysis generally cover the period 1996-2008 and originate from the following European sources:

- (a) the EUROSTAT web data base;
- (b) the EUROSTAT Regional Yearbook 2009;
- (c) the 4<sup>th</sup> Report on economic and social cohesion, 2007;
- (d) the ESPON data base and
- (e) the ESPON Atlas.

### ***3.1. The State of European Islands***

The answer to the question “**what is the situation of European Islands within the context of sustainable development?**” is derived by pointing out the differences that distinguish the islands from the EU-27 as well as from their national entities. The following analysis is structured in 3 sections that correspond to the three components of sustainable development: the efficiency of islands’ economy; the social equity; and the environmental conservation.

#### *3.1.1. Efficiency of Islands’ economy*

The degree of the economic success of a region is usually assessed with the use of the Gross Domestic Product (GDP) that describes the value of its output and the effectiveness of its economic system. The GDP per inhabitant (in PPS) is even more helpful to compare economic growth and the effectiveness of the economy between areas, while its change rate estimates its dynamism. However, the use of this indicator is straightforward only if all the persons involved in generating GDP are also residents of the region in question which is not the case for most of the islands<sup>20</sup>.

The majority of NUTS 2 and 3 islands (24 out of 31, island states included) have GDP per capita (in PPS) below the EU27 average (79,2 in 2006 with EU27=100), while its distribution was only at 20,3 when for the EU-27 was at 50,0 (EU, 2009, p.8-9). Only Åland, Illes Balears (NUTS 2), Shetland and Kyklades (NUTS 3) perform better than the European average (146,7, 114,1, 110,9 and 104,0 in 2006 respectively) and Åland, Illes Balears and Kyklades better than the national average. The overall figures are presented in Table S3.1.1 for NUTS 2 & 3 islands (Map S2).

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<sup>20</sup> Tourism is a typical economic activity that raises production in an area; in many cases an important part of employers and employees does not reside permanently in it. Therefore, the activity generates GDP, but part of this production ‘leaks’ out of the area along with the people that leave when the season ends. In parallel, the created GDP is divided by the number of the permanent inhabitants, giving a high GDP/capita indicator.



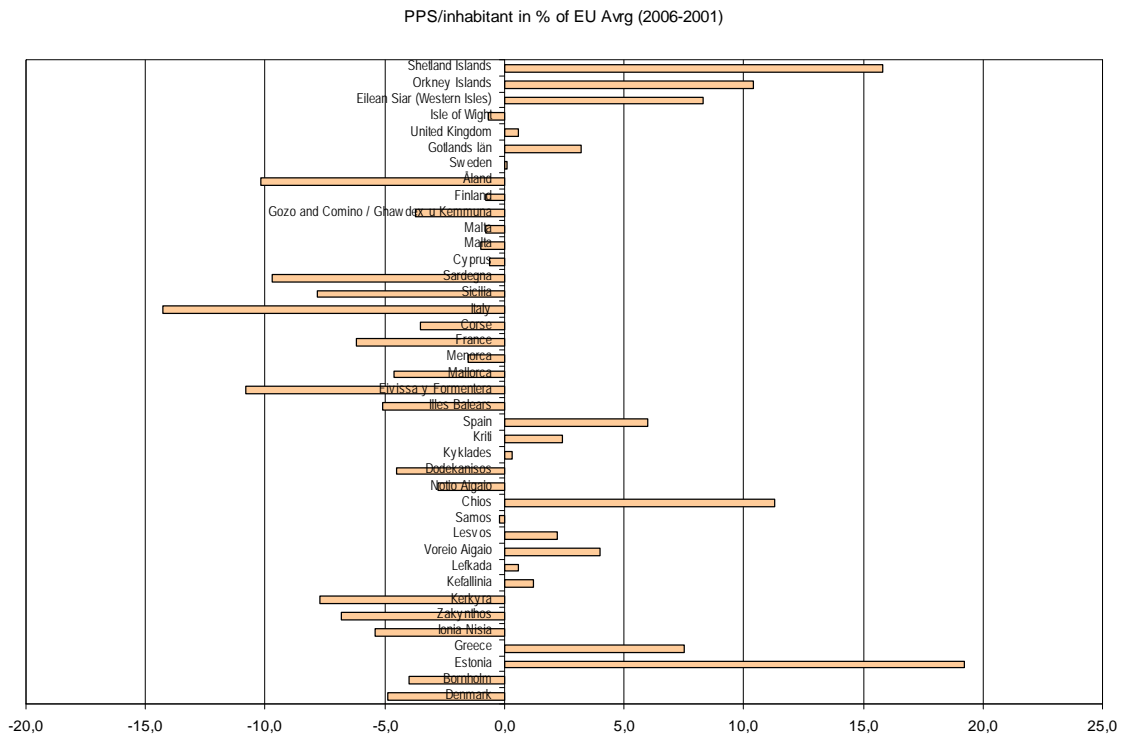
Table S3.1.1: Islands Regions, Cohesion Policy objectives and GDP (2006)

Regions	NUTS	Cohesion Policy Objective	% of EU27 average 2006	% of National average 2006
Cyprus	2	Phasing-in	90,3	100,0
Bornholm	3	Competitiveness & Employment	89,4	72,7
Illes Balears	2	Competitiveness & Employment	114,1	109,6
<i>Eivissa y Formentera</i>	3	Competitiveness & Employment	123,8	118,9
<i>Mallorca</i>	3	Competitiveness & Employment	111,5	107,1
<i>Menorca</i>	3	Competitiveness & Employment	124,2	119,3
Åland	2	Competitiveness & Employment	146,7	127,7
Corse	2	Competitiveness & Employment	85,8	78,4
Ionia Nisia	2	Convergence	73,9	78,5
<i>Zakynthos</i>	3	Convergence	92,3	98,1
<i>Kerkyra</i>	3	Convergence	67,1	71,3
<i>Kefallinia</i>	3	Convergence	82	87,1
<i>Lefkada</i>	3	Convergence	64,9	69,0
Voreio Aigaio	2	Convergence	67,4	71,6
<i>Lesvos</i>	3	Convergence	64,1	68,1
<i>Samos</i>	3	Convergence	65,4	69,5
<i>Chios</i>	3	Convergence	75,9	80,7
Notio Aigaio	2	Phasing-in	96,2	102,2
<i>Dodekanisos</i>	3	Phasing-in	91,7	97,4
<i>Kyklades</i>	3	Phasing-in	104	110,5
Kriti	2	Convergence	82,8	88,0
Sicilia	2	Convergence	66,9	64,6
Sardegna	2	Phasing-in	79,5	76,8
Malta	2	Convergence	76,9	100,0
<i>Malta island</i>	3	Convergence	78,4	102,0
<i>Gozo and Comino /Ghawdex</i>	3	Convergence	59,2	77,0
Gotlands län	3	Competitiveness & Employment	98,1	80,7
Isle of Wight	3	Phasing-out	81,1	67,4
Eilean Siar (Western Isles)	3	Phasing-out	77,7	64,5
Orkney Islands	3	Phasing-out	94	78,1
Shetland Islands	3	Phasing-out	110,9	92,1

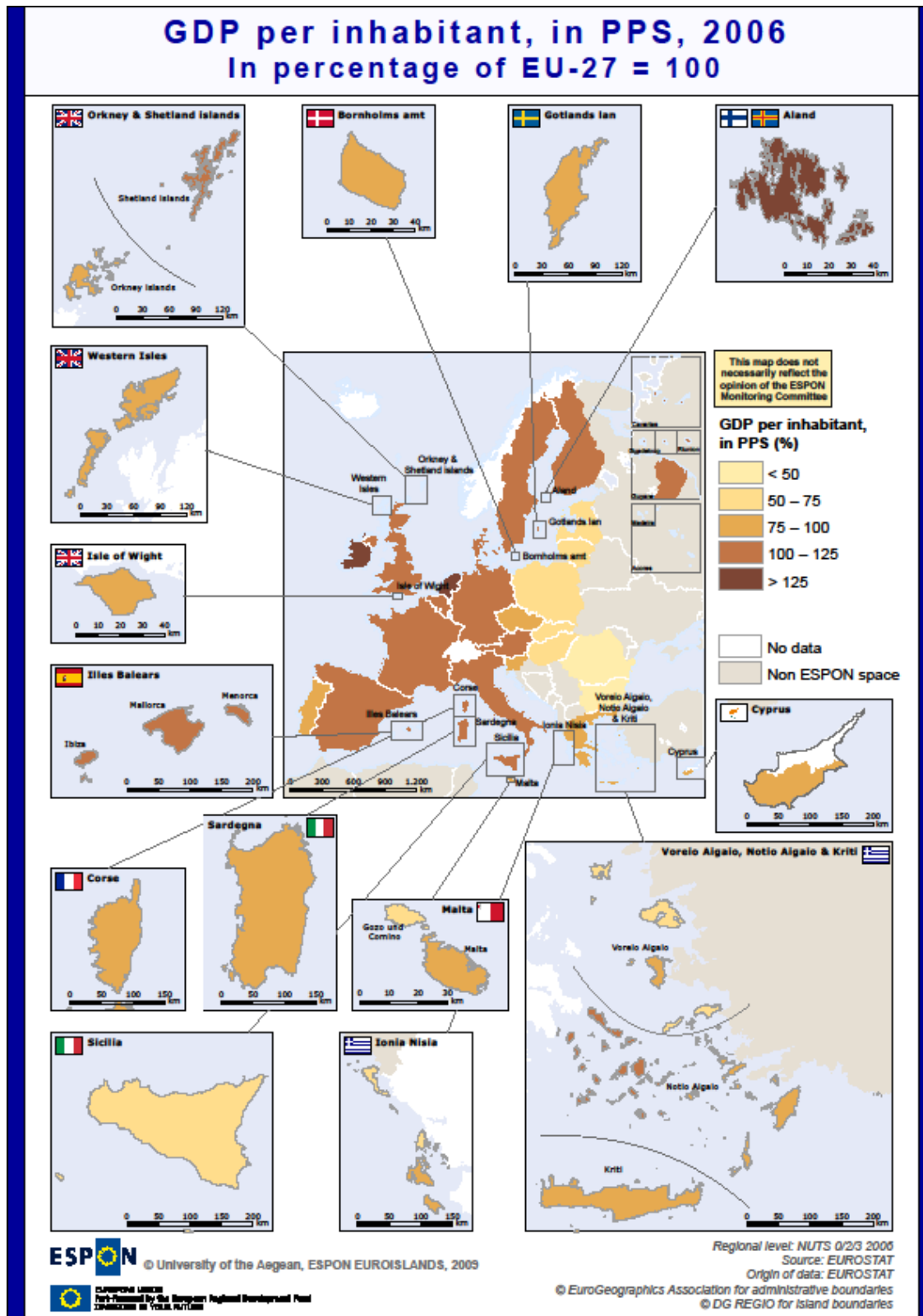
Source: EUROSTAT, TPG calculations

The economic convergence in terms of GDP of the examined NUTS 2/3 island regions with the EU27 average from 2000 to 2006 was positive for some of the NUTS2/3 regions with Western Islands, Shetland, Chios, Kefallinia having the best scores. On the contrary, Sardegna, Sicilia, Malta, Bornholm, Kerkyra and Dodecanisos faced a net divergence compared to EU-27. One region, Ionia Nissia, fell again below the 75% limit of the European average. Consequently, in this period, the majority of the island regions has not followed the trends of the countries and diverged from the EU average (Map S3).

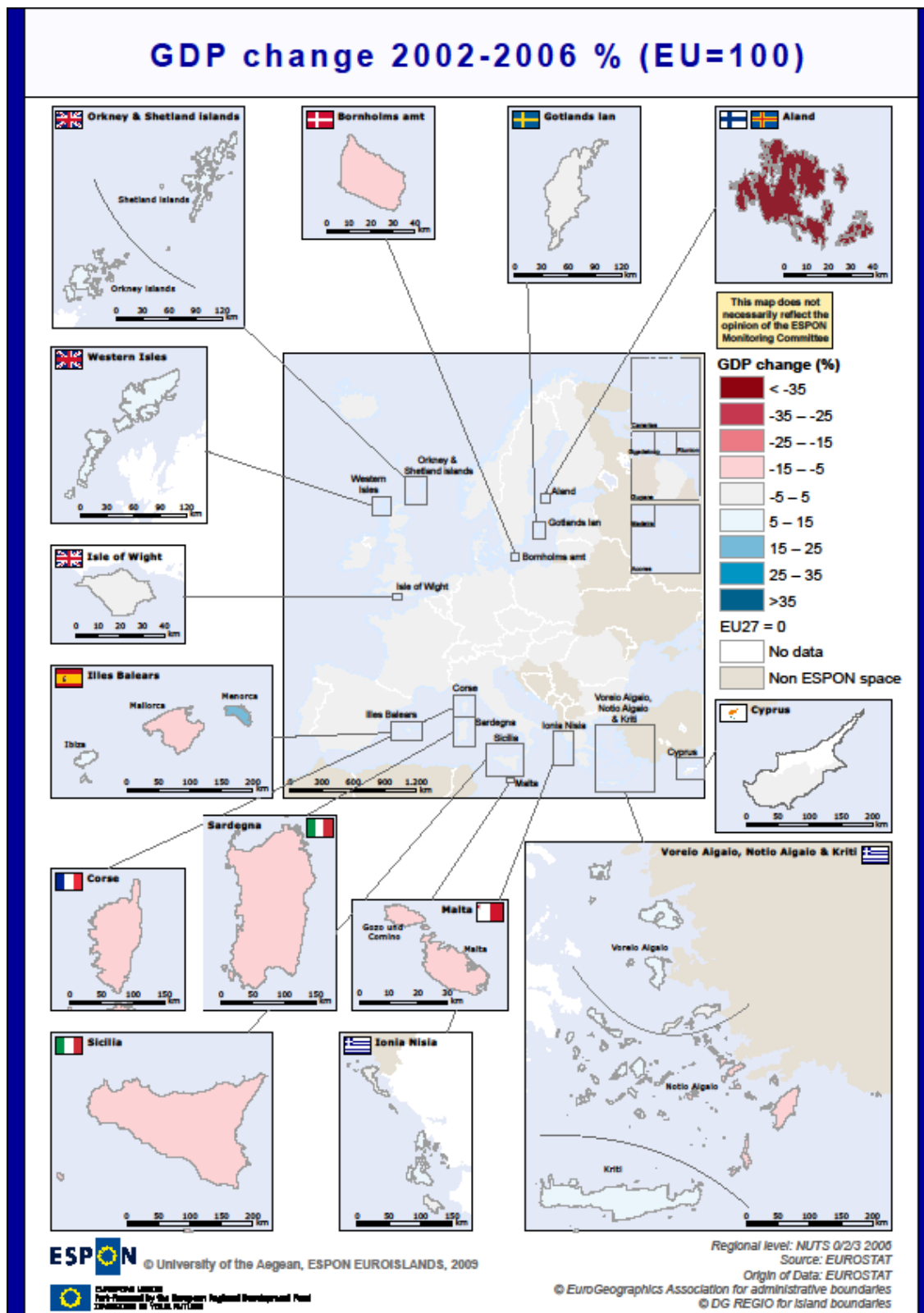
Graph S3.1.1: Evolution of GDP/capita in PPS (2000-2006)



Map S2: GDP per inhabitant of Member States and island regions, in PPS, 2006



Map S3: GDP change % (2002-2006) for Islands states, NUTS 2 and NUTS 3 islands



It has also to be noticed that Mallorca's GDP per capita fell from 120,7 to 111,4 during that period due to a slower growth rate than the EU average. Is it a signal of "crisis" for the Balearic model?

Productivity level is also diverging (EU, 2007, p.178-195): in Corse, Sardegna, Sicilia, and Åland productivity is above the EU 27 average (in the 100 - 120 class) following the trend of their respective countries. Notio Aigaio and Illes Balears have better scores than the national ones (106,9 compared to 85,1 and 94,5 compared to 91,7 respectively). On the contrary, in Cyprus, Ionia Nisia, Voreio Aigaio and Malta productivity is very low.

### *Development of the economy and long term prospects*

The structure of the economy of the island regions per sector is very diverse (Table & graph S3.1.2): services are the most important activity, but the gross value added produced by the sector fluctuates between 65% for Orkney and Shetland Islands to 85% for Åland. This is the result of the presence of an important public sector for some of the islands, e.g. Gotland (41,2%), Western Isles (37,8%), Bornholm (37,0%) and Corse (36,2%). Menorca with 15,8% and Kyklades 16,4% and generally the Illes Balears and the Greek Islands are in the other end of the spectrum. The island states Malta and Cyprus occupy the space in the middle with 26,7% and 24,4% of their GDP coming from the public sector respectively, following the trend of many other member states (e.g. Denmark 27,0%, France 25,4%, Sweden 25,3%, Greece 23,9%).

These differences are evident in the small islands as well, with Nordic islands having an important public sector: on the islands of Lipsi and Kalymnos (Greece) the employment in the public sector is approximately 16%, whereas in Kokar it stands at 40% (39 on 98 people) and in Samsø at 36% (employment data are the second best choice in small islands where GDP and GVA data are not available).

This high presence of non commercial services in some islands **underlines the low performance of competitive sectors and demonstrates an explicit policy choice of developing public services.**

Other services, such as transport (Åland) or tourism (Illes Balears and Greek Islands) are very important in some islands with more than 40% of the GVA produced by these branches. Two Greek islands (Lesvos and Chios) and Cyprus have important financial sectors (real estate, renting and other services to companies and individuals).

Table S3.1.2: Structure of the Gross Added Value (2006, %)

	Primary Sector	Secondary Sector	Manufacture - Mining - Electricity - Water	Constructions	Tertiary Sector	Trade - Hotels - Transport	Financial Sector	Public Services
CY Cyprus	2,4	19,0	10,3	8,6	78,6	27,6	26,7	24,4
DK Denmark	1,6	26,0	20,5	5,5	72,4	21,5	24,0	27,0
DK014 Bornholm	2,7	18,7	11,4	7,3	78,6	22,1	19,5	37,0
EE Estonia	3,1	29,7	21,2	8,5	67,2	28,3	23,0	15,9
ES Spain	2,9	29,9	17,8	12,2	67,2	24,8	21,5	20,8
ES53 Illes Balears	1,1	18,0	7,0	11,0	80,8	39,3	22,1	19,4
ES531 Eivissa y Formentera	0,8	14,9	4,6	10,3	84,3	43,1	22,6	18,6
ES532 Mallorca	1,1	18,3	7,3	11,0	80,6	38,8	21,8	20,0
ES533 Menorca	1,8	20,5	8,4	12,1	77,7	38,2	23,7	15,8
FI Finland	2,5	32,4	26,4	6,0	65,1	22,1	21,0	22,0
FI20 Åland	1,8	13,7	8,6	5,2	84,5	46,5	13,0	25,1
FR France	2,1	20,7	14,5	6,2	77,3	19,0	32,9	25,4
FR83 Corse	2,1	15,0	5,5	9,5	82,8	22,4	24,2	36,2
GR Greece	4,1	21,0	13,7	7,3	75,0	31,8	19,3	23,9
GR22 Ionia Nisia	3,8	16,7	5,9	10,8	79,4	39,0	20,3	20,1
GR221 Zakynthos	5,3	16,9	4,5	12,4	77,8	43,1	17,8	16,9
GR222 Kerkyra	2,6	13,9	6,2	7,8	83,5	42,8	20,7	20,0
GR223 Kefallinia	5,4	22,1	7,2	14,9	72,5	30,2	21,7	20,6
GR224 Lefkada	3,8	20,7	5,5	15,2	75,5	25,9	21,4	28,2
GR41 Voreio Aigaio	8,0	19,1	8,8	10,3	72,9	22,2	26,2	24,5
GR411 Lesvos	10,2	16,9	8,9	7,9	72,9	20,8	26,3	25,9
GR412 Samos	4,7	18,3	8,2	10,1	77,0	28,7	24,1	24,2
GR413 Chios	6,4	23,7	9,0	14,6	70,0	20,0	27,6	22,4
GR42 Notio Aigaio	3,2	17,2	7,9	9,3	79,6	42,4	18,6	18,6
GR421 Dodekanisos	2,9	15,0	6,4	8,6	82,1	45,4	16,7	20,0
GR422 Kyklades	3,7	20,6	10,2	10,4	75,7	37,6	21,6	16,5
GR43 Kriti	8,2	16,8	8,3	8,5	75,0	32,8	18,0	24,2
IT Italy	2,1	26,8	20,7	6,1	71,1	22,8	27,2	21,1
ITG1 Sicilia	4,0	16,7	10,7	6,0	79,3	21,2	24,1	34,0
ITG2 Sardegna	3,5	19,1	13,1	6,0	77,3	23,6	23,3	30,5
MT Malta	2,8	21,6	17,7	3,9	74,7	27,4	21,6	26,7
MT001 Malta	2,5	21,9	18,0	3,8	74,8	27,6	21,7	26,5
MT002 Gozo and Comino	7,9	18,2	12,4	5,9	71,9	25,8	20,8	27,2
SE Sweden	1,4	27,9	23,2	4,7	70,6	19,9	25,4	25,3
SE214 Gotlands län	3,4	16,8	11,3	5,5	79,8	18,3	20,4	41,2
UK United Kingdom	0,7	23,6	17,3	6,3	75,6	21,3	31,0	23,4
UKJ34 Isle of Wight	1,1	21,5	13,8	7,7	77,4	30,7	14,4	32,3
UKM64 Western Isles	6,7	19,6	10,2	9,5	73,6	22,7	13,1	37,8
UKM65 Orkney Islands	12,7	21,3	10,1	11,3	65,9	27,4	9,2	29,3
UKM66 Shetland Islands	10,5	23,6	13,6	10,0	65,9	24,3	8,9	32,7

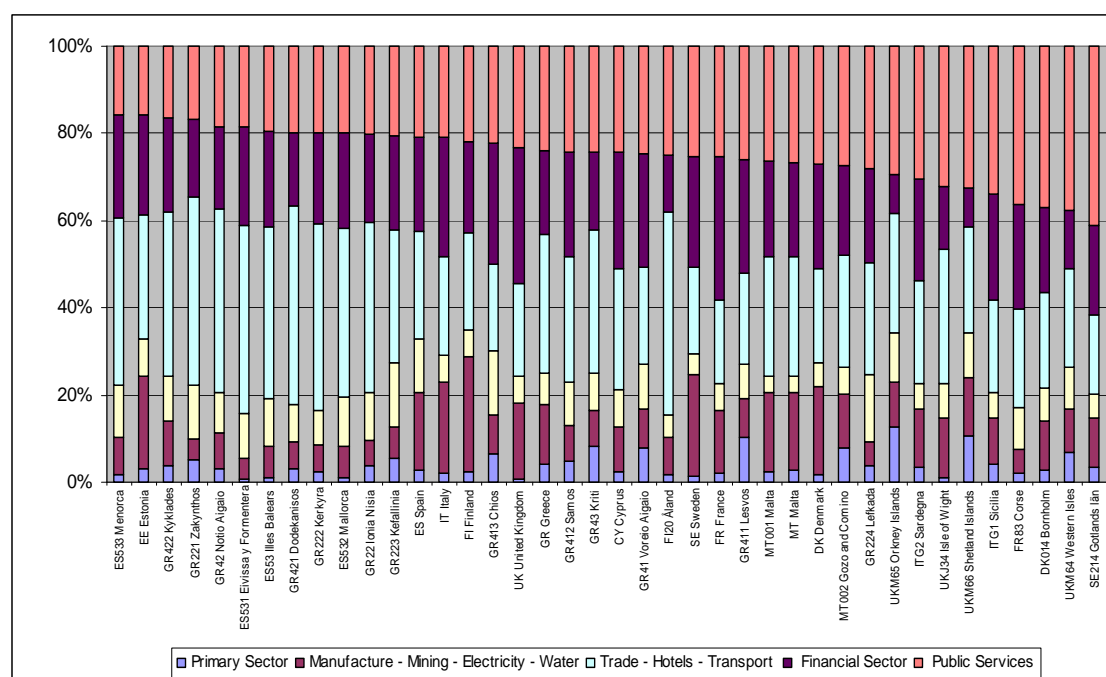
Source: EUROSTAT

The construction branch is important (more than 10%) on Illes Balears and on most of the Greek islands, and is related with tourism and residential economy in general. The rest of the secondary sector (manufacture, mining, energy) is rather underrepresented in islands compared with the EU and the member-states (even though energy has to be produced locally for most of the islands). On Malta island, the single higher value of the sector is recorded with 21,9% of the total GDP whereas in Åland the lowest value stands at 13,7%.

Finally, the primary sector is important compared to the EU27 average in the Scottish Islands, Kriti, Lesvos and Gozo, with more than 8% of the GVA. On the contrary, in Illes Balears, Åland and the Isle of Wight the presence of the primary sector is less than 2%, the first two performing well above the average in economic terms. Farming and fisheries are also important in small islands in Brittany

and in Sweden, in Lipsi and Kalymnos<sup>21</sup> either as a competitive high quality sector or for the service of the local market.

Graph S3.1.2: Structure of GVA for Member States and Island regions (in %, 2006)



Concerning employment by sector, 7 NUTS 2 island regions plus Cyprus face high business concentration in one or few branches, with tourism being the branch with the single higher concentration, except for Åland where sea transport activities predominate (EUROSTAT, Regional Yearbook 2009). Illes Balears and Corse have high percentages in air transport also due to the presence of regional companies in their territory. On the contrary, “business services” (real estate, renting, computer activities, R&D, legal business services, accounting and management, advertising, architectural, engineering but also security and cleaning, secretarial, translation services, etc.) which are considered the most dynamic elements of a modern economy have a low presence on islands.

As for the profile of island specialisation within Europe, their main characteristic is the importance of market and non market personal services and construction (non competitive activities) along with tourism and/or agriculture and fisheries, two sectors characterised by low value added, excessive use of natural resources and strong

<sup>21</sup> Employment data are used for smaller islands: e.g. in Lipsi 20% are employed in the primary sector and 15,5% in Kalymnos.

competition from non European countries with low labour costs. It seems that an important part of the activities on islands are characterized by survival strategies of subsistence, mainly on small islands. Within this context, the long-term economical perspectives seem rather fragile.

Irrespective of size, this analysis indicates that islands **with better economic performance** compared to the rest and the EU27 average can be classified in two categories:

- Islands with very clear **international specialisation in a low added value activity** such as the *tourism sector* (Illes Balears, Notio Aigaio, Zakynthos, Cyprus). Monoculture is the basis of their current prosperity, which has yielded good results, but at the same time they are more vulnerable than other areas during a crisis.
- Islands with a GDP "boosted" by **specific exogenous influences**, such as Åland, Shetland, Orkney and Gotland. Such influences range from are the existence of a duty free area (Åland) to oil extraction (Shetland), rather than the utilization of local comparative advantages. The presence of the State is an important reason. This public sector acts like a lever for development, creates employment and GDP, improves the attractiveness for residence (more public services), but presupposes the possibility and the policy option of transferring public resources, human capital and know-how from the national mainland. Islands with a developed and efficient public sector are in general less vulnerable and exposed to external influences; but this option is under threat within a period of bugjet restriction.

The evolution of employment can also be used as an indicator of the dynamism of the economy, especially when GDP is unavailable. Data for the period 2000-2006 reveal a mixed picture: in some islands such as Cyprus, Corse and Illes Balears, the increase of the employed is remarkable and higher than the EU27 average and national averages, less important in Åland, Ionia Nissia and Sardegna and lower in the rest (Table 3.4.3).

*Box 1: Main issues in the analysis of islands' economy:*

- Islands have an average GDP/capita lower than the EU 27 average, and only few of them perform better (Åland, Illes Balears, Shetland and Kyklades). In general the process of economic convergence is slower than for the rest of the EU regions.
- Islands are lagging compared to their national entities (except Åland, Kyklades and Illes Balears)
- For many islands (Nordic islands, Corse, Sicilia and Sardegna)



GDP level and employment are sustained by an important public sector; this is a sign of low competitiveness of the economy.

- Even though services remain the most important activity, two main groups with competitive activities are found: (a) islands where tourism prevails, and (b) few islands with a significant activity in agriculture and fisheries.
- Long term development perspectives seem rather fragile – even in the islands with high performance-, because of the predominance of low value added activities in an increasingly competitive international environment based on an excessive use of scarce natural resources.

### *3.1.2. Social equity*

#### *Population evolution and structure*

The structure of a population and its change is affected by a number of factors, both external to the area and internal. External factors, such as economic conditions, changes in life styles, cultures and aspirations are considered as more important for shaping the demographic profile of an area. For islands, the demographic profiles have been profoundly changed during the last decades. Here, we focus on differences between islands and the European mainland and discuss some important differences between islands.

A general demographic trend of the end of the 1990s was a population decrease on a number of regions in the European periphery, but also in some of the core regions (e.g. in some regions of Germany, Italy and France). This was the result of negative natural balance or of negative migratory balance or a combination of both (ESPON Atlas, 2006, p.10). Most of the island regions considered in this study followed this trend: Sardegna, Sicilia, Voreio Aigaio recorded a significant decline of their population mainly due to a negative natural balance when Gotland, Western Isles and Shetland displayed a minor decrease. Another group of islands, including Illes Balears, Isle of Wight, Kriti, Malta, Cyprus, Notio Aigaio and Åland, recorded an increase.

During the 2000s (Map S4), population projections are in general positive for Western Europe with only a limited number of regions facing population decline (Germany, many Greek regions and some Scandinavian regions), while in Eastern Europe continuing emigration caused again negative trends. For island regions, the evolution is generally positive, with Illes Balears recording the best results (2,89% per year and 4,17% for Eivissa y Formentera) followed by Cyprus (1,63%) and Corse (1,52%). In the Scottish islands, Gotland and Bornholm in the North, Sicilia and Voreio Aigaio in the South the population seems to stabilise or decrease

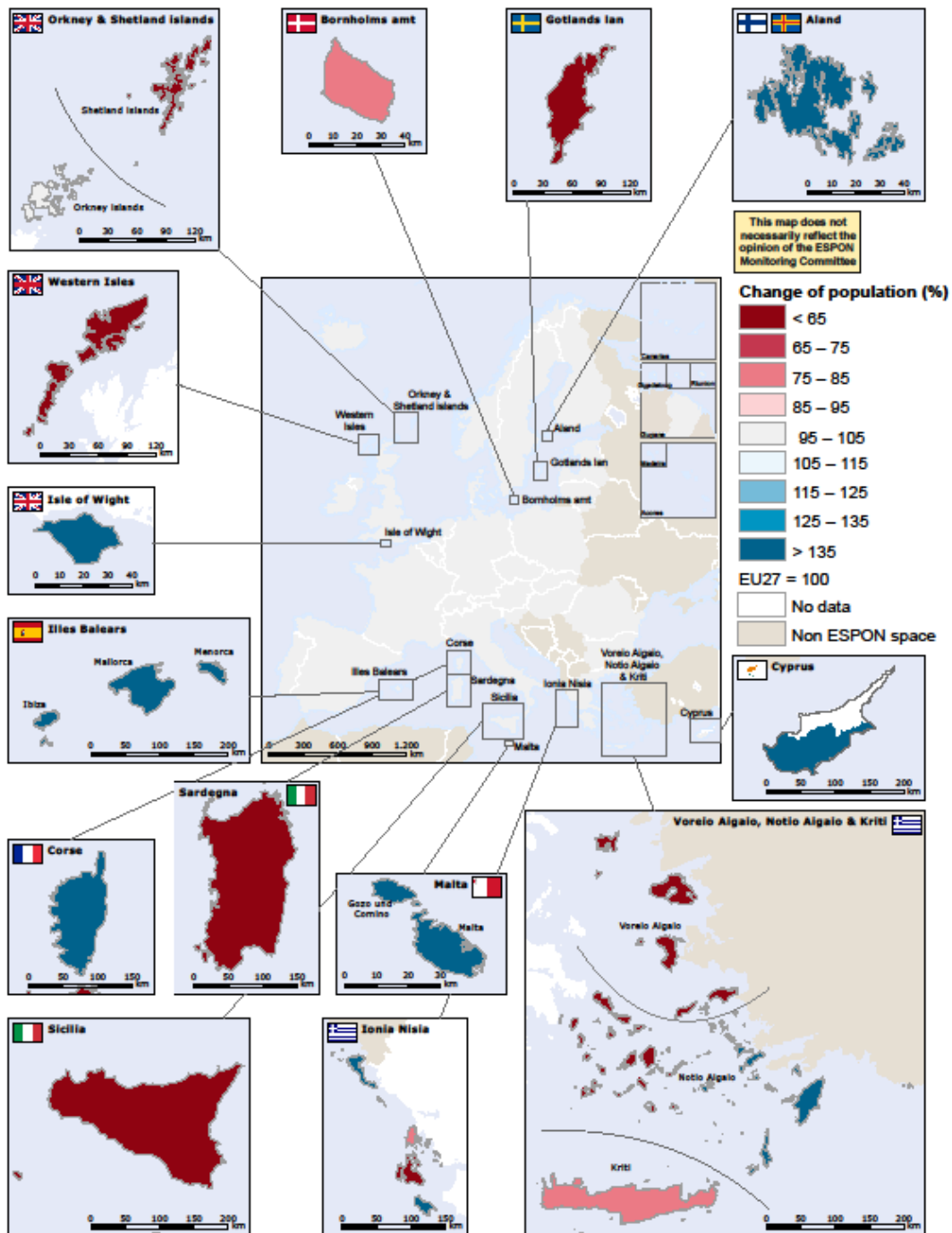
slowly. Insights from ESPON 2013 FOCI project confirm this evolution. These positive results **seem to come from positive immigration flows and not from natural change**, as fertility rates are stable and rather low (1,3%) and the replacement level is 2,1 children per woman. This positive immigration has improved the age pyramid as well, as immigrants are younger and have more children (EUROSTAT, Regional Yearbook 2009). These migrants come either from Eastern Europe or from Asia and Africa (legally or illegally) for almost all islands that are external borders.

The recent positive evolution of the population of islands (+0,85%, EU, 2009, p.8) compared to previous decades and the European average (0,37%) obscures the situation of smaller islands especially in archipelagos. In *Åland region* the smaller islands, such as *Kokar*, lose population that moves to the capital city of Mariehamn. In *Lispi* and *Kalymnos*, as it is the case for most of the Greek islands, after a major decrease during 1950-80, there is a small population increase that does not compensate for previous population losses.

In *Saaremaa* the negative trend observed during the soviet occupation halted in the '80s to restart again during the '90s following a national trend of out-migration and smaller families; so the population has declined by 13% (from 39.890 in 1990 to 34.723 in 2009). *Samso* and *Kokar* are facing the same trends with slower rates. In *Lipari* an increase of 6% during the period 1997-2006 was observed. In French *Ponant Islands* the trends are less optimistic as the rapid population decrease till the '80s is followed today by a slower but continuous decrease. In the small *Swedish islands* there is a stabilisation of the population mainly on account of the islands that are close to Stockholm.

Map S4: Change of Population 2000-2006

## Change of Population (2000-2006)



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**EUROPEAN UNION**  
Part-financed by the European Regional Development Fund  
under the LEADER Initiative

Regional level: NUTS 0/2/3 2006

Source: EUROSTAT

Origin of Data: EUROSTAT

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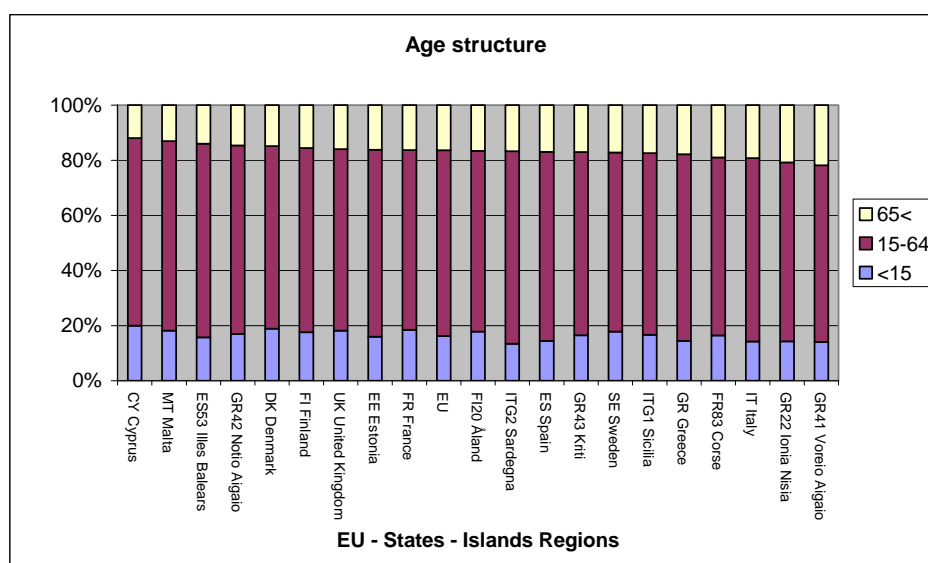
### Age structure

Demographic trends have a strong impact on the societies of the European Union. The low fertility rates combined with an extended longevity result in demographic ageing of EU population and the share of the population aged over 65 is increasing. In 2007, the average population in the EU-27 at this age was 17%, which means an increase of 2% in the last 10 years especially in rural areas (EUROSTAT, Regional Yearbook, 2009).

According to EUROSTAT estimations for 2004 and 2007 (EUROSTAT 2004, 2009) several regions are characterized by high percentages of aged people. With an EU27 average of population older than 65 at 16,4%, in countries such as Germany, Italy, Greece, France and Spain the percentage is higher than 20%. For islands, in regions such as Voreio Aigaio and Ionia Nissia the percentages are 21,8% and 20,8% respectively, while in other island regions the percentages are closer to the average or lower, with Corse at 19%, Sicilia at 17,4%, Kriti at 17%, Sardegna at 16,7%, Åland at 16,6%, Notio Aigaio at 14,6%, Illes Balears at 14%, Malta at 13% and Cyprus at 11,9% (Map S5 and Graph S3.1.3).

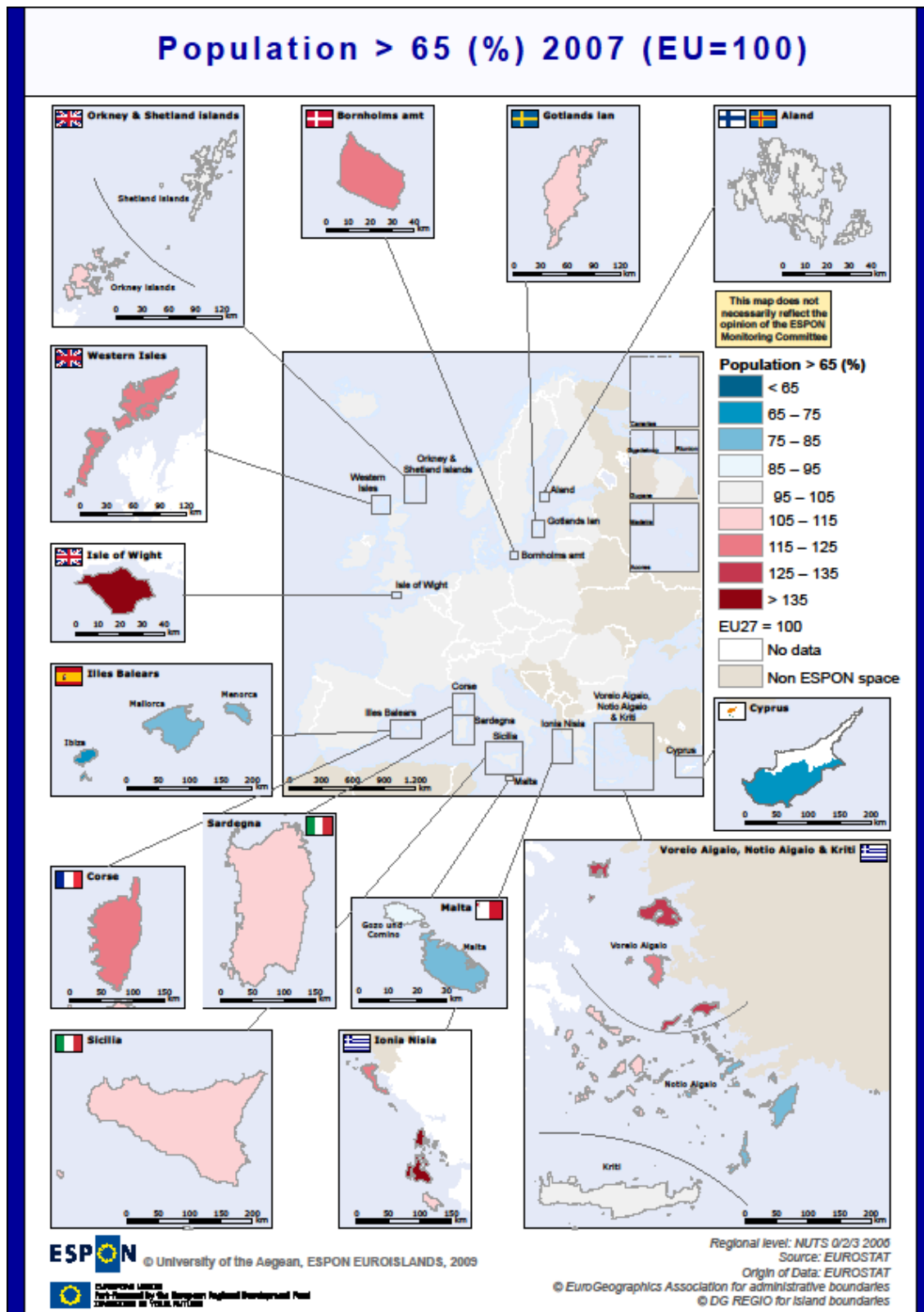
Data from the case studies give more extreme results: Kalymnos has only 11,1% of population over 65 due to very high fertility rate, Lipsi and Lipari 18,4%, Saaremaa 18,3% and Kokar 24,8%. For young people, the corresponding data are 16,1% for Lipari, 14,9% for Kokar, 14,4% for Saaremaa, 19,1% for Lipsi and 20,4% for Kalymnos. **This implies that the percentage of the dependant population is very high on small islands.**

Graph S3.1.3: Population Age Structure (2006) EU average, Member states, NUTS II islands



Source: EUROSTAT web database, 2009, processed by TPG

Map S5: Population ageing (>65 years old) for Island states, NUTS 2 and NUTS 3 islands



### Economically active Population and Employment Rate<sup>22</sup>

These two indicators are important as they give an indication of the dynamism and the competitiveness of the local economy. Demography influences the supply of labour but the economic performance creates jobs opportunities and demand for labour in terms of numbers and skills.

Economically active population rate is more influenced by demography as it reflects the percentage of the young (<15) and the old (>65) population of the area. Only 4 islands (Zakynthos, Eivissa I Formentera, Åland and Gotland) out of the 28 island NUTS 0, 2 and 3 areas (EUROSTAT data base, 2006) have a score better than the EU average 54,5% (Table 3.1.4. - Map S7).

UK's and Denmark's regions, most of the Swedish, Dutch and some German regions exceed the 63,3% of European average of active population rate. Åland is among them with 77,6% (EU, 2005). In the Mediterranean some of the regions with the worst performance in Europe are located, together with many regions in Eastern Europe: Malta with 53,9% Corse with 52,8%, Sardegna with 51,6% and Sicilia with 44,1%. Voreio Aigaio has also a rather low score: 56,8%. The other regions are performing better with a score around the European average: the Illes Balears Region with 67,9% is almost approaching the Lisbon target (70,0%) followed by Kriti (64,9), Cyprus (64,5%), Ionia Nissia (64,0), and Notio Aigaio 63,0.

The same pattern is observed for female activity (Graph 4): with a European average at 55,9%, Åland is the leading region with 76,7% followed by Cyprus (58,4%) and Illes Balears (57,5%); while Sicilia and Malta have the lowest scores (28,1% and 32,1% respectively).

**A first conclusion from the above data is that Åland - following Nordic trends- and the tourism influenced islands (mainly Illes Balears, Cyprus and Notio Aigaio) have employment rates higher than the EU average and the rest of the island regions.**

### Unemployment

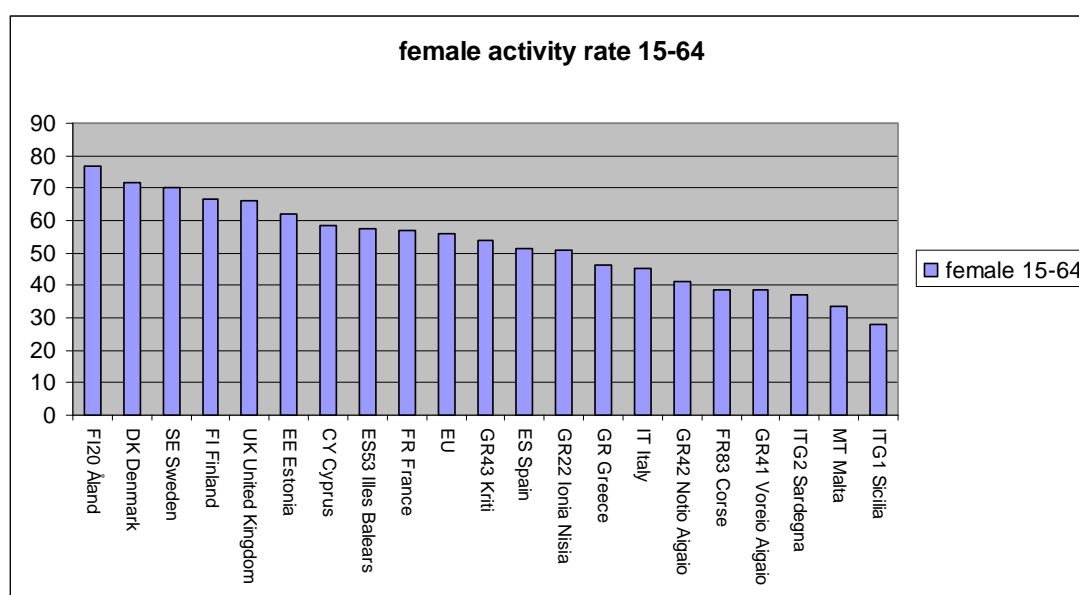
Unemployment is a very important parameter for social cohesion as it raises the risk of poverty and weakens the social fabric. It is the most visible sign of labour market imbalances, reflecting shortfall in jobs, mismatch between offered and needed skills and structural deficiencies. But, the complete picture is not always provided by the unemployment rate alone, as in areas with limited employment

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<sup>22</sup> Economically active population is the % of the population between 15 and 64 years old on the total population; employment rate is the % of the active population that is working or unemployed.

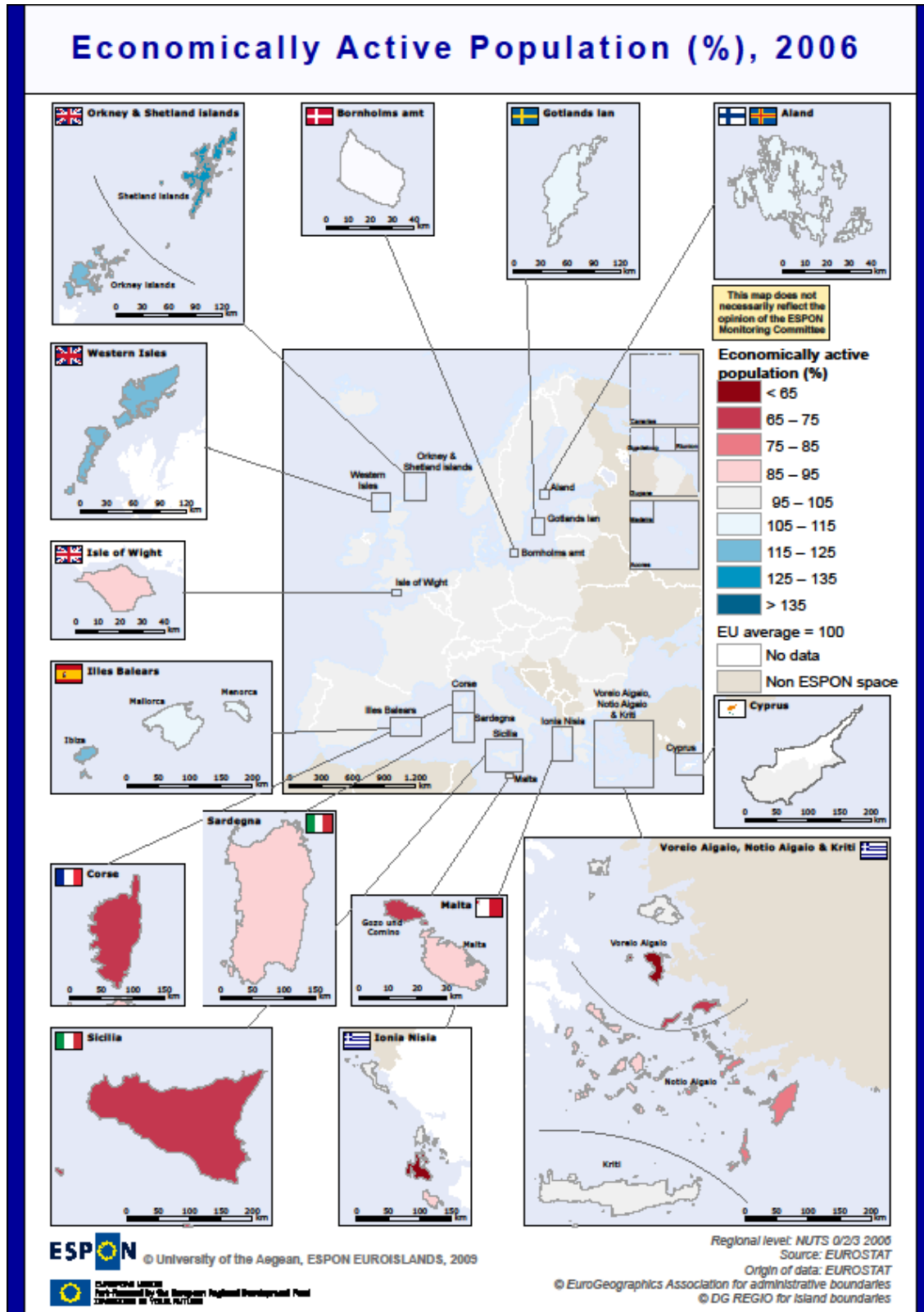
opportunities some choose to abandon the labour market or to emigrate. Therefore, the unemployment rate could be low, but jobs could be sparse at the same time. Such an example seems to be Malta, where the absence of job opportunities is reflected by the very low activity rate but not by the unemployment rate. Women, the young and long term unemployed provide complementary information for the labour picture of the endogenous potential of the region.

Graph S3.1.4: Female Activity Rate (2005 - %) EU average, Member states, NUTS II islands



With an average EU 27 rate at 7% for 2008, East Germany, Poland, many Finish regions and a big part of the Mediterranean regions face serious unemployment problems (EUROSTAT, 2009). In 2007, this EU27 average was at 7,5% compared to 11,6% for island regions (EU, 2009, p.8). Among these regions, Sicily, Sardegna, Kerkyra, Zakynthos, the Dodecanese and Corse perform worse, while Åland and generally the Nordic islands perform better (Map 5, Table AVII-2). The changes of the unemployment rate are very diverse: e.g. in Corse it dropped from 22,2% to 8,2% from 2000 to 2007, in Voreio Aigaio from 11,5% to 4,5%, in Sardegna from 20,0% to 12,2% and in Sicilia from 24,0% to 13,8%, compared to the EU average drop of 1,7%. These changes appear to highlight ***structural employment problems in these areas, rather than indicating a sharp rise of employment.***

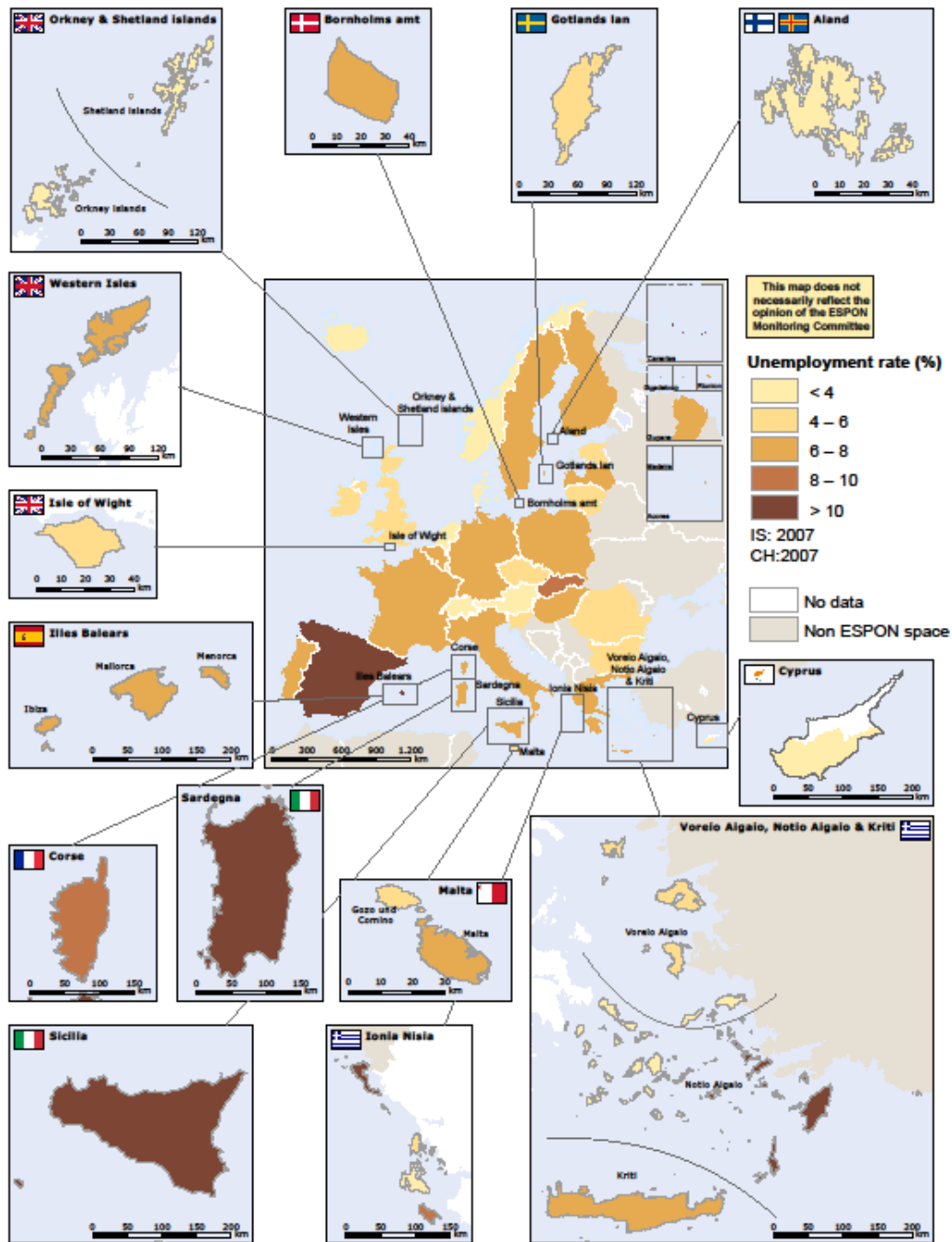
Map S6: Economically active population % of total population (2007) for Member states, Island states, NUTS 2 and NUTS 3 islands





Map S7: Unemployment rate (total, 2008)

## Unemployment Rate (%), 2008 for the 15 and over age group, total population



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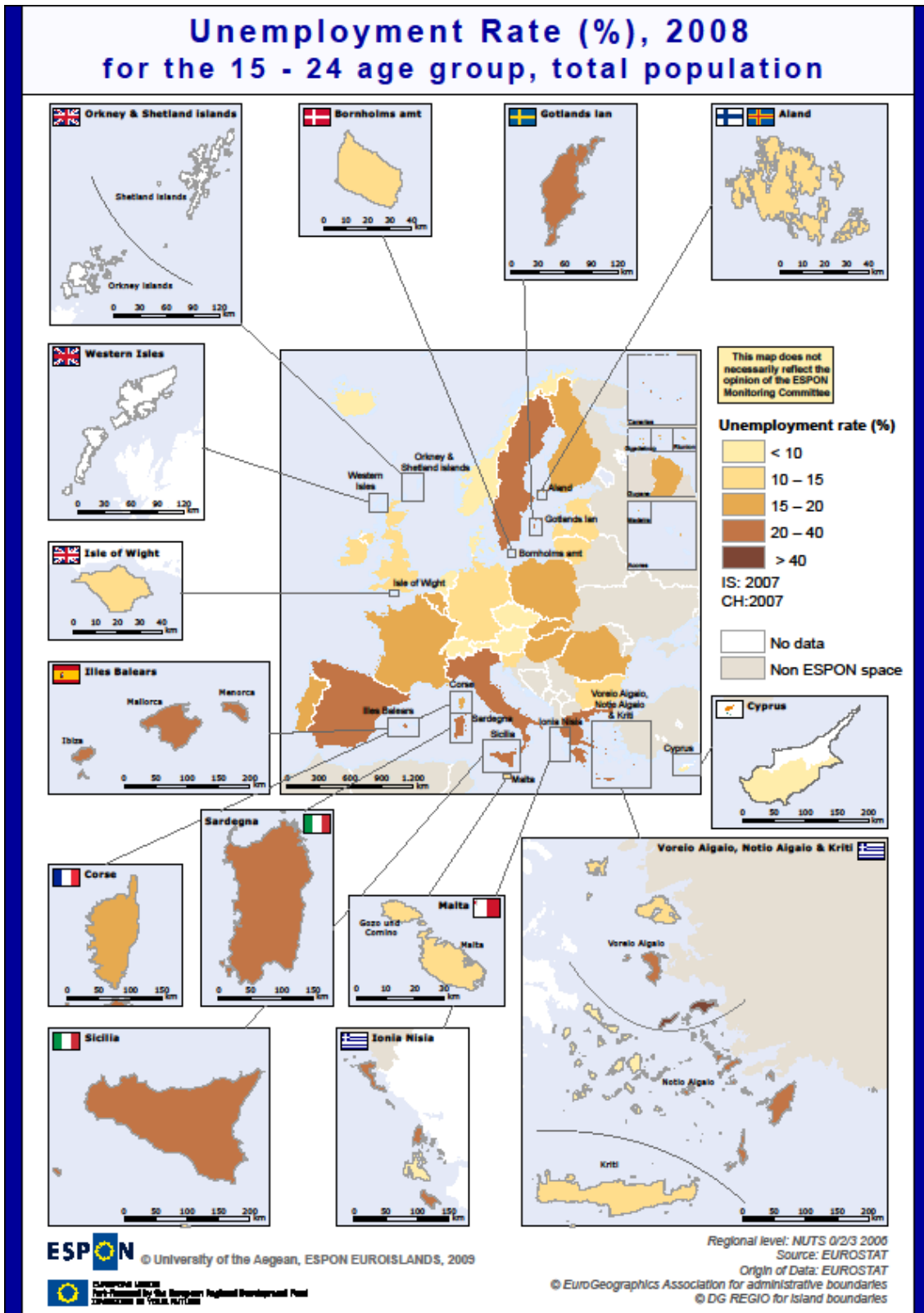
Regional level: NUTS 0/2/3 2006

Source: EUROSTAT

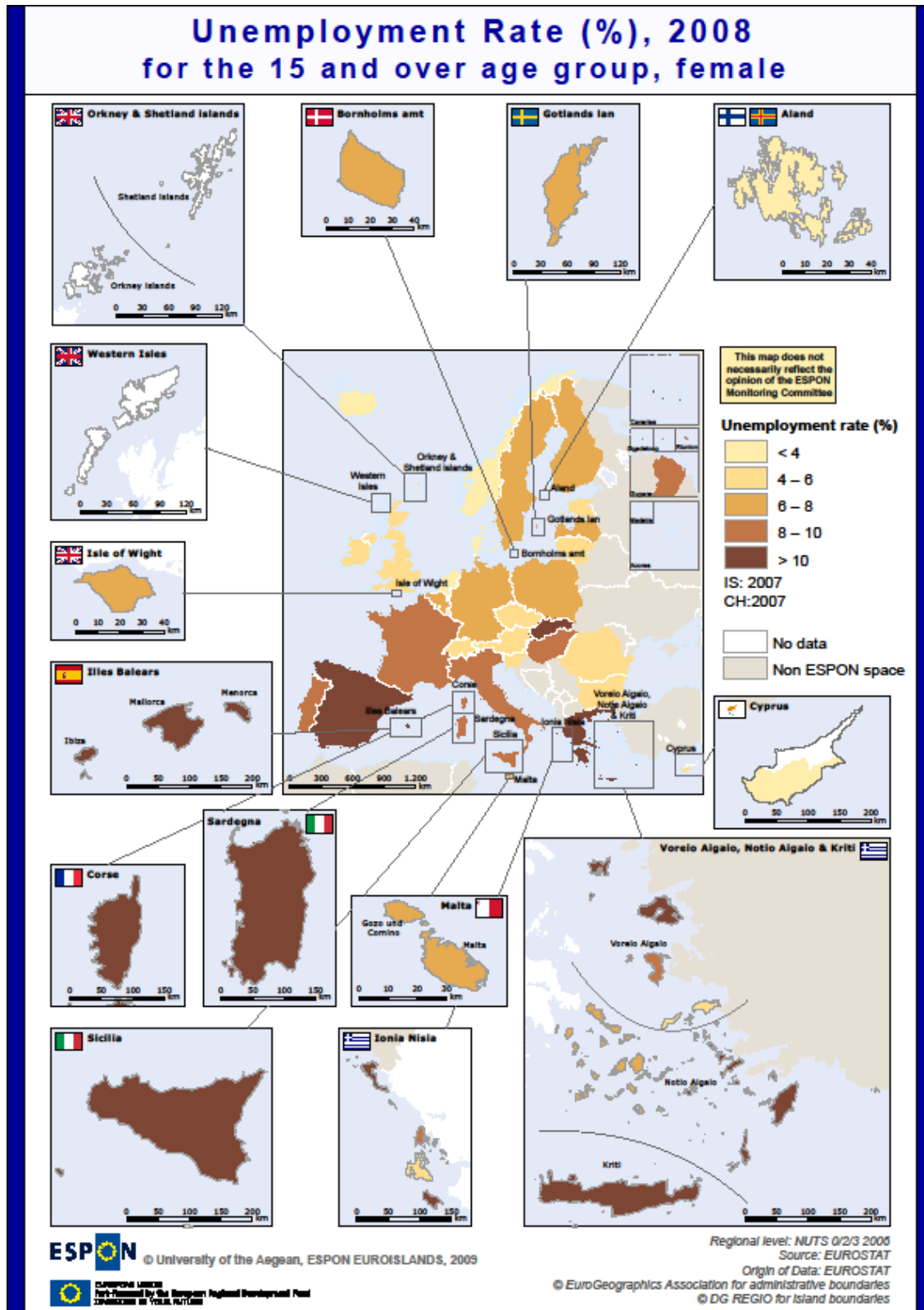
Origin of Data: EUROSTAT

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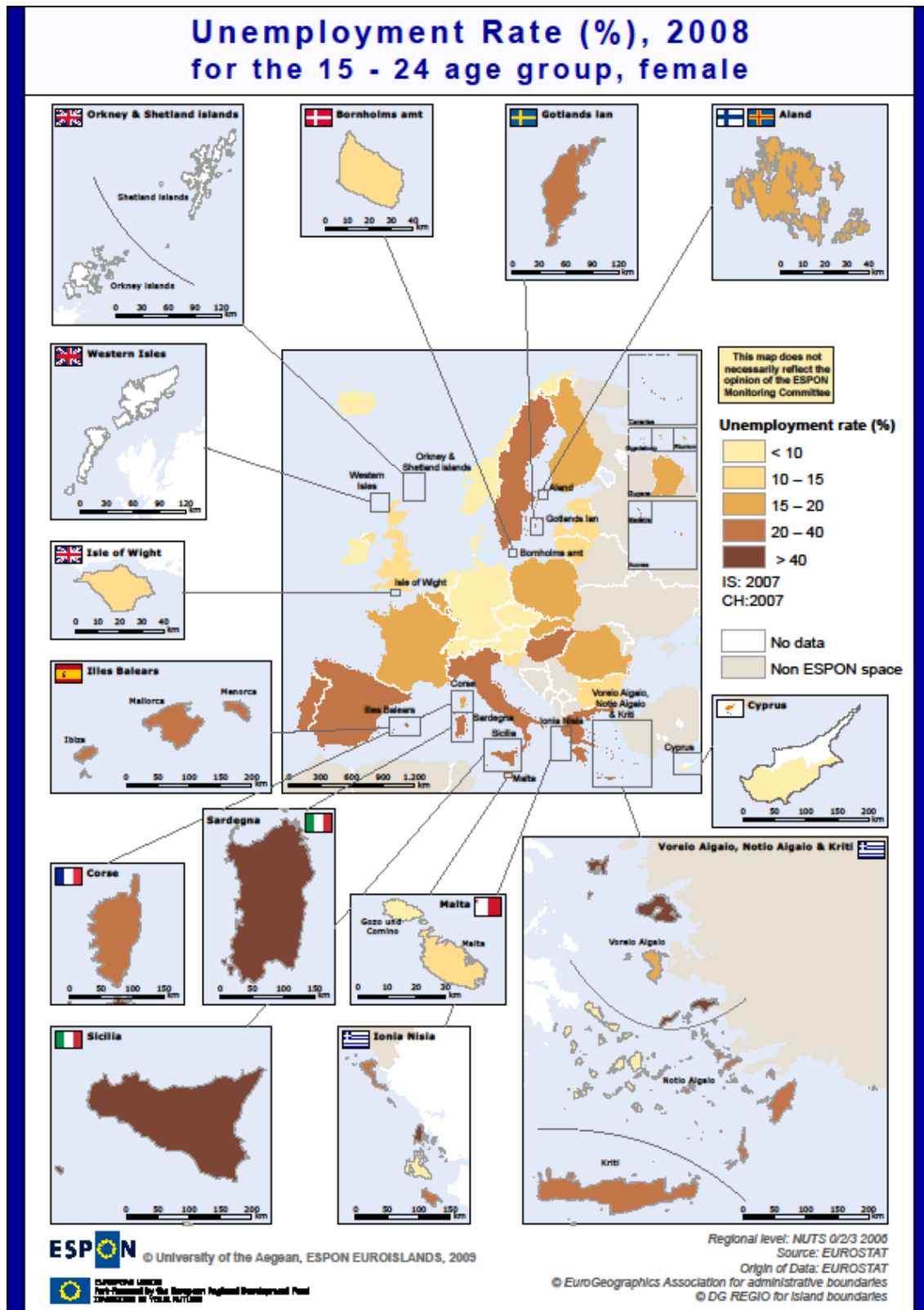
Map S8: Unemployment rate for the 15-24 age group for Member states, Island states, NUTS 2 and NUTS 3 islands



Map S9: Women unemployment rate % for age group >15, for Member states, Island states, NUTS 2 and NUTS 3 islands



Map S10: Unemployment rate of females' % (2008) for the 15-24 age group for Member states, Island states, NUTS 2 and NUTS 3 islands



Unemployment of the young in EU 27 is more than double of the overall unemployment rate (15,5% compared to 7% in 2008). The lowest rate is recorded in Cyprus with 9%, while the highest ones on Sicilia and Sardegna of 39,3% and 36,8% respectively (Table S3.1.4, Map S8). Unemployment of women is higher in the 7 NUTS 2 island regions for which data are available (no data available for Åland and Voreio Aigaio) than the EU 27 (7,5% in 2008); only Cyprus (4,2%) and Malta (6,8%) have recorded better scores, while on Sicilia, Sardegna, Notio Aigaio, Ionia Nissia and Corse rates of more than 12% are recorded (Table S3.1.4, Map S9). Long-term unemployment is very high in Corse, Sardegna, Sicilia, and Voreio Aigaio (more than 45%, with a EU 27 average at 37,2%, Table S3.1.4).

### Income

As already analyzed, the Gross Domestic Product is an index for measuring the efficiency of the economy. However owing to different interregional linkages and state interventions, the GDP generated in a given region does not always correspond to the income available to the inhabitants of the region. Therefore, in order to estimate the population's welfare the knowledge of income levels (primary and disposable) per inhabitant and its trends is necessary.

The first important issue revealed by incomes is the risk of poverty<sup>23</sup> for different groups of population. For islands, with an EU-27 average income of 16.200 € for 2006, (EUROSTAT, 2009) only in Åland (17.190 €) and Illes Balears (18.306 €) the incomes are higher. On the contrary, in Sicilia (11.372 €) and the Greek insular regions the average income per capita is very low (e.g. in Ionia Nissia 10.176 € and in Kriti 10.856 €) and close to 60% of the European average (no data available for Cyprus and Malta).<sup>24</sup> Out of these regions, in Sicilia the average income is also close to the national poverty rate (average income for Italy at 17.632 €) which means that an important part of the population of the island is living in poverty. Considering that the non active (young, women and older people) and the unemployed have a higher poverty risk and

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<sup>23</sup> The population, whose disposable income is below 60% of the national average level of income, as measured by the median (on the assumption that household income is distributed evenly between all members), is considered to be in a risk of being socially excluded.

<sup>24</sup> More recent data (2008), for population at risk of poverty after social transfers, confirms the above analysis and gives information for Malta and Cyprus: with an EU average of 17% of the total population, the performance for Illes Balears 13,8%, for Cyprus 15%, for Malta is 16%, for Nissia Aigaiou and Kriti 19,0% for Corse 20,8%, for Sardegna 23,4% and for Sicilia 37% (EU, Investing in Europe's future, preliminary version, 2010).

having in mind the low active population percentages in most of the island regions, these seem to tend to concentrate high percentage of population at poverty risk.

In combination with previous results, the main conclusion is that the size of the island does not seem to affect income, which is positively correlated with economic performance.

Considering the disposable income, only in Åland and the Balears there is a difference between the primary and the disposable income (the disposable stands at 78% and 84,5% of the primary respectively). For all other island regions, the variation between primary and disposable income is not important.

*Box 2: Main issues of the analysis on the social equity:*

- After a general population decrease in the nineties, the trend is **rather positive** since the 2000s, mostly due to **migration** flows. But this is shielding an *important and persistent decrease* trend that characterises the **smaller islands**, especially in archipelagos.
- Activity rate is **significantly higher in the Nordic and the touristic islands**.
- **Unemployment**, especially of young and female, is rather **high** but there is no correlation with the level of GDP.

### 3.1.3. Environmental conservation

Environmental conservation concerns the capacity of the natural capital to ensure the supply of environmental goods and services to a specific community and to preserve ecosystem functions and increase the quality of life. This capacity is endangered by the pressures inflicted by human activities. For island regions, previous ESPON studies (ESPON 2006a; 2006b) will be used to assess pressures from the population and human interventions.

Population density is used as a first approach, although it does not include seasonal pressures by non permanent residents and tourists. New constructions that are added to the existing ones increase these pressures, as the residential economy has become a very important activity in the majority of the islands.

The classification of islands by their population density yields very diverse results (Map S11):

- **Very sparsely populated islands**, with less than 12,5 inhabitants per km<sup>2</sup> (c. 58.000 inhabitants). Most of these are in North Europe but there are some in the Mediterranean (Notio Aigaio). The majority (147 islands) is small islands with

population less than 50 inhabitants, but there are 73 islands with population between 50 and 5895 (Uist – Western Isles).

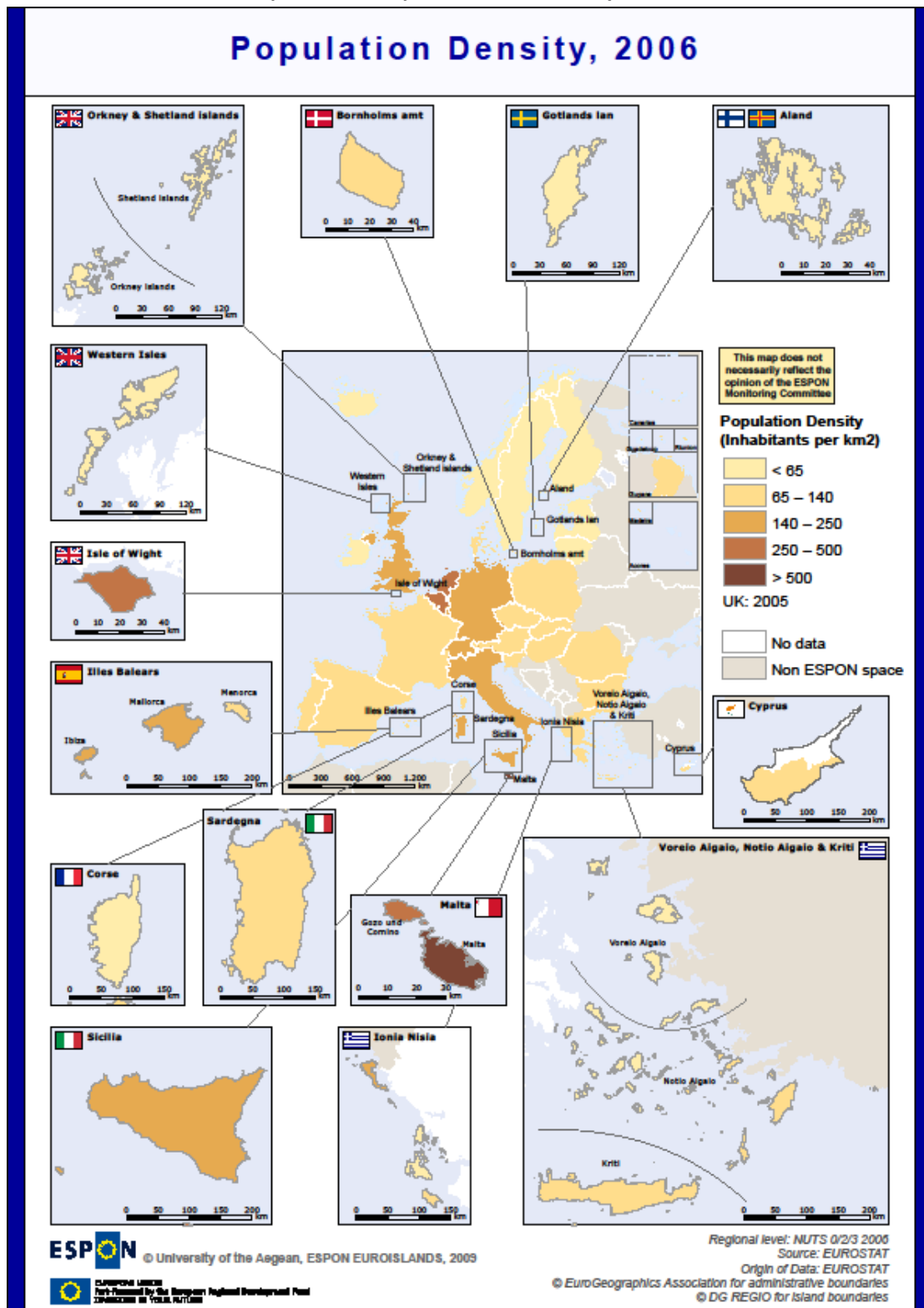
- **Sparsely populated islands**, with density between 12,5 and 50 inhabitants per km<sup>2</sup>, approximately 60.000 inhabitants in total. The category includes 60 very small islands, plus 123 larger ones.

- **Islands with intermediate density**, between 50 and 114 inh./ km<sup>2</sup> (the EU27 average). In this category, 12 small and 53 larger islands are included, with approximately 3,5 million people in total.

- **Densely populates islands**, with higher population density than the EU average (114 inhabitants/ km<sup>2</sup>). In this category, 5 small and 58 large islands are included. From these, 35 have more than 200 inhabitants/km<sup>2</sup> and 15 of them over 500 (Malta, 4 Italian coastal islands from which Ischia is the most densely populated one and 10 coastal islands in northern Europe are included). In general, pressures on the resources of all these islands are very high and so is the **artificialization of the environment**. On the islands of this category live approximately 6,8 million islanders. A brief description of the state of island environment follows.

Map S11: Population Density, 2006

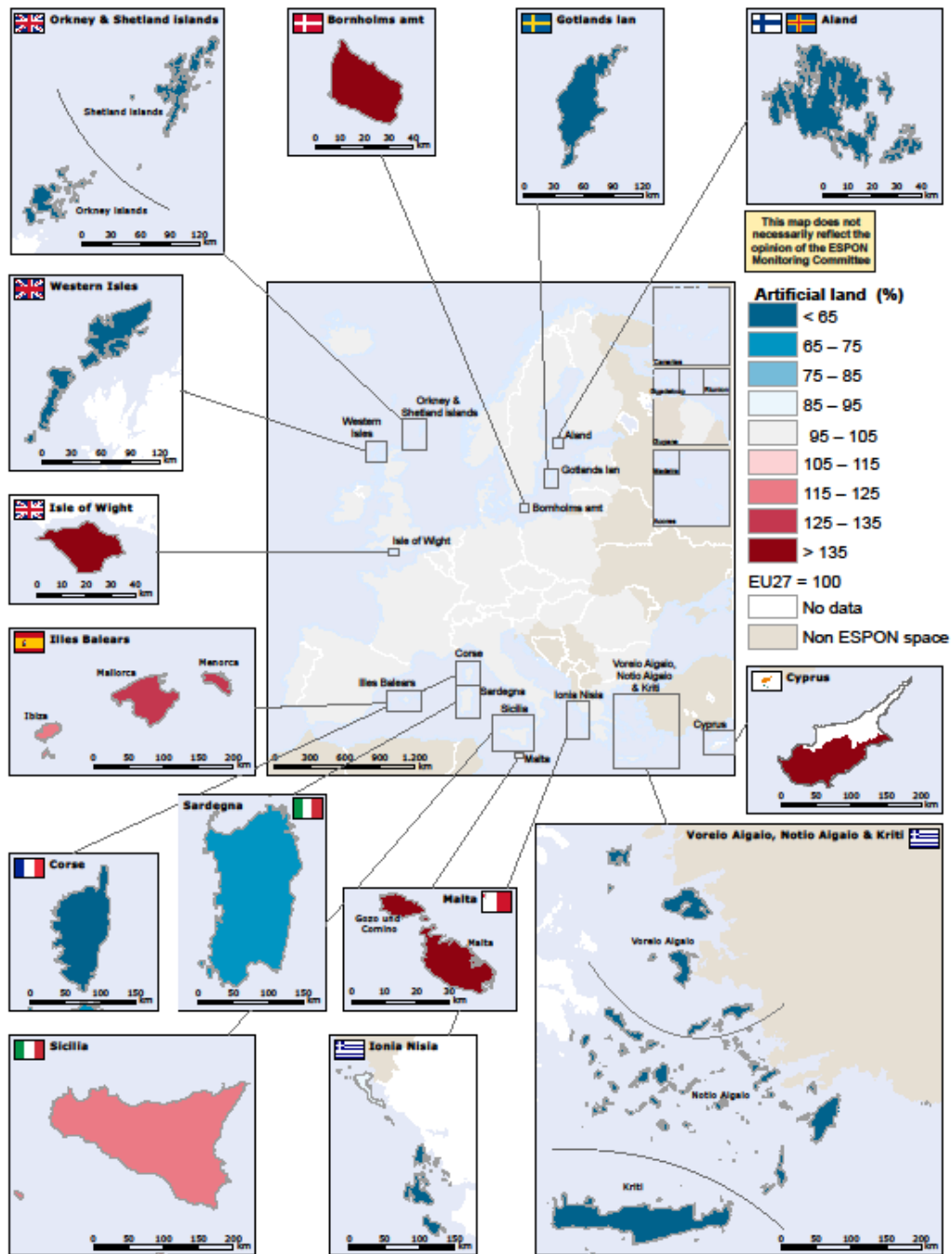
## Population Density, 2006





Map S12: Artificial land % of total land

## Artificial land % of total land, 2000 (EU27=100)

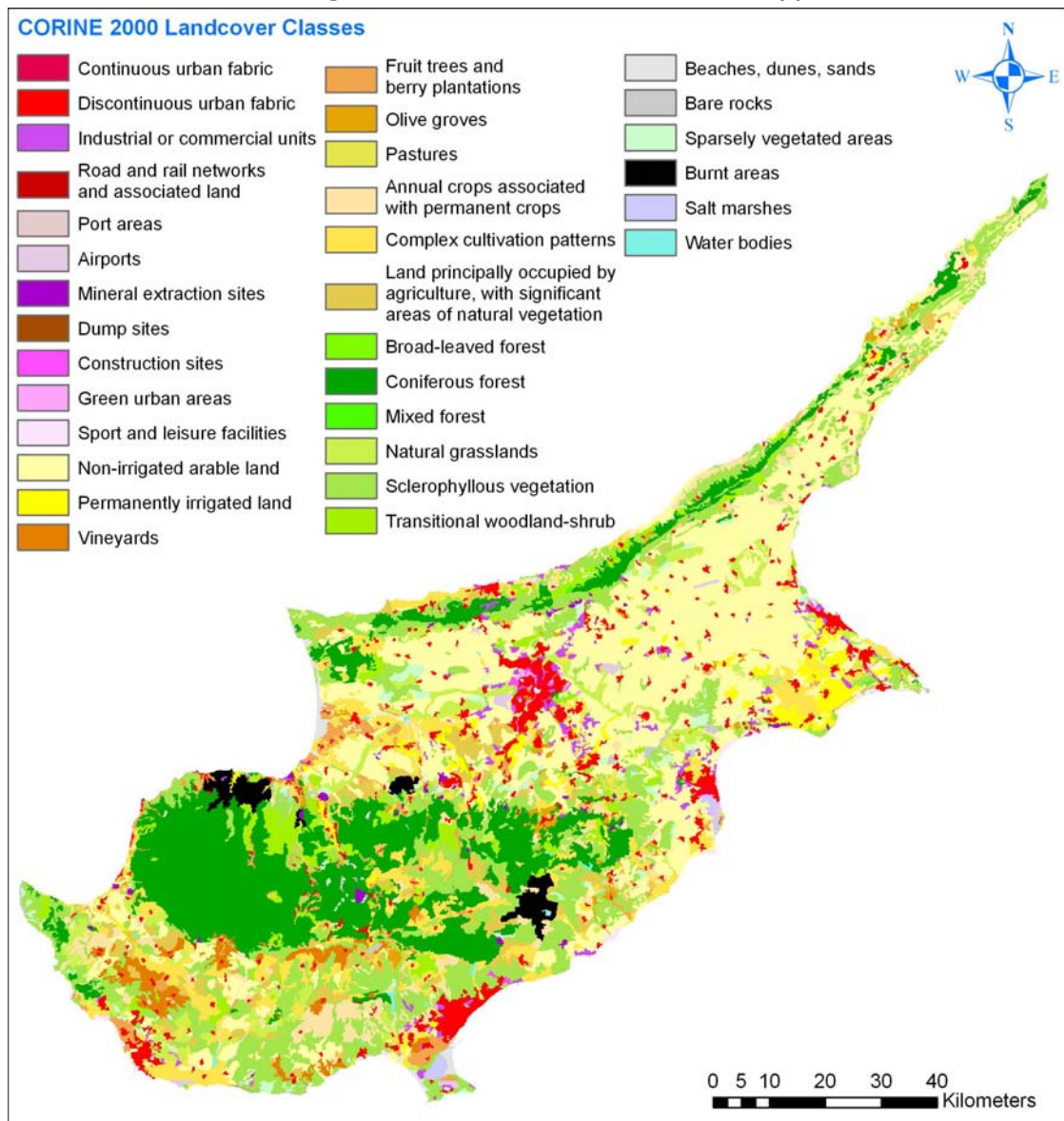


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Development in Your Region

Regional level: NUTS 02/3 2006  
Source: CORINE 2000 DB  
Origin of data: CORINE 2000 DB  
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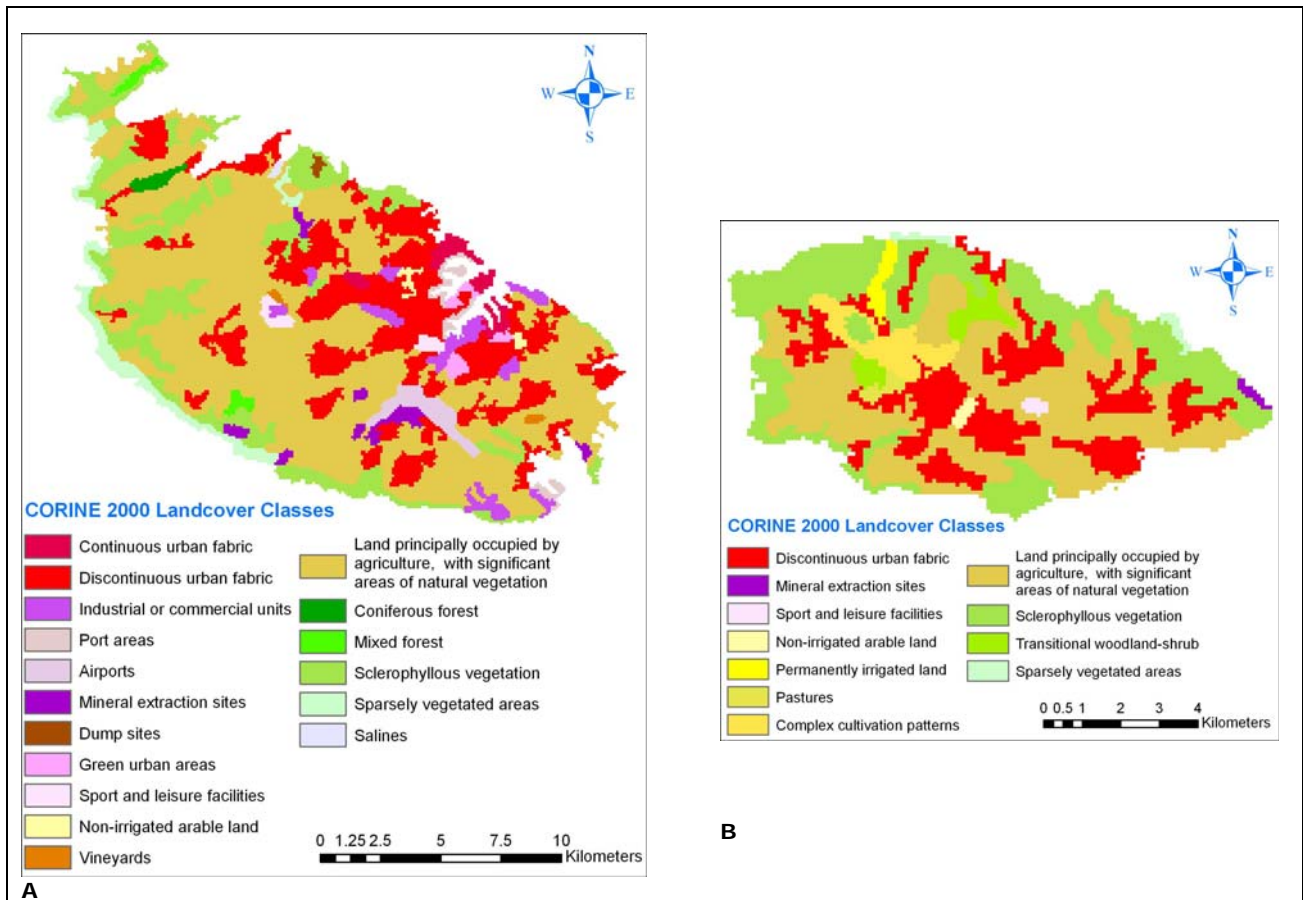
Figure S3.1.1: Land Cover of Cyprus



#### *Land use and land cover*

The part of the area under artificial cover is the first indication of existing pressures. In this study, the analysis of artificialization is limited to the nine case study islands with the use of Corine data. In three of them (Malta, Gozo and Lipari, Figures S3.1.2 and S3.1.3) artificial areas cover more than 10%. In Malta and Gozo, natural areas cover a limited part of the islands (18,7% and 33,8%) and the rest of the area is dedicated to agriculture. On Lipari more natural areas (57,2%) and less agricultural lands (18,6%) are found. Cyprus (Figure S3.1.1) and Mallorca (Figure S3.1.3) follow with artificial surfaces, with 7,5 and 5,5% respectively of their total surface.

Figure S3.1.2: Land Cover of (a) Malta and (b) Gozo



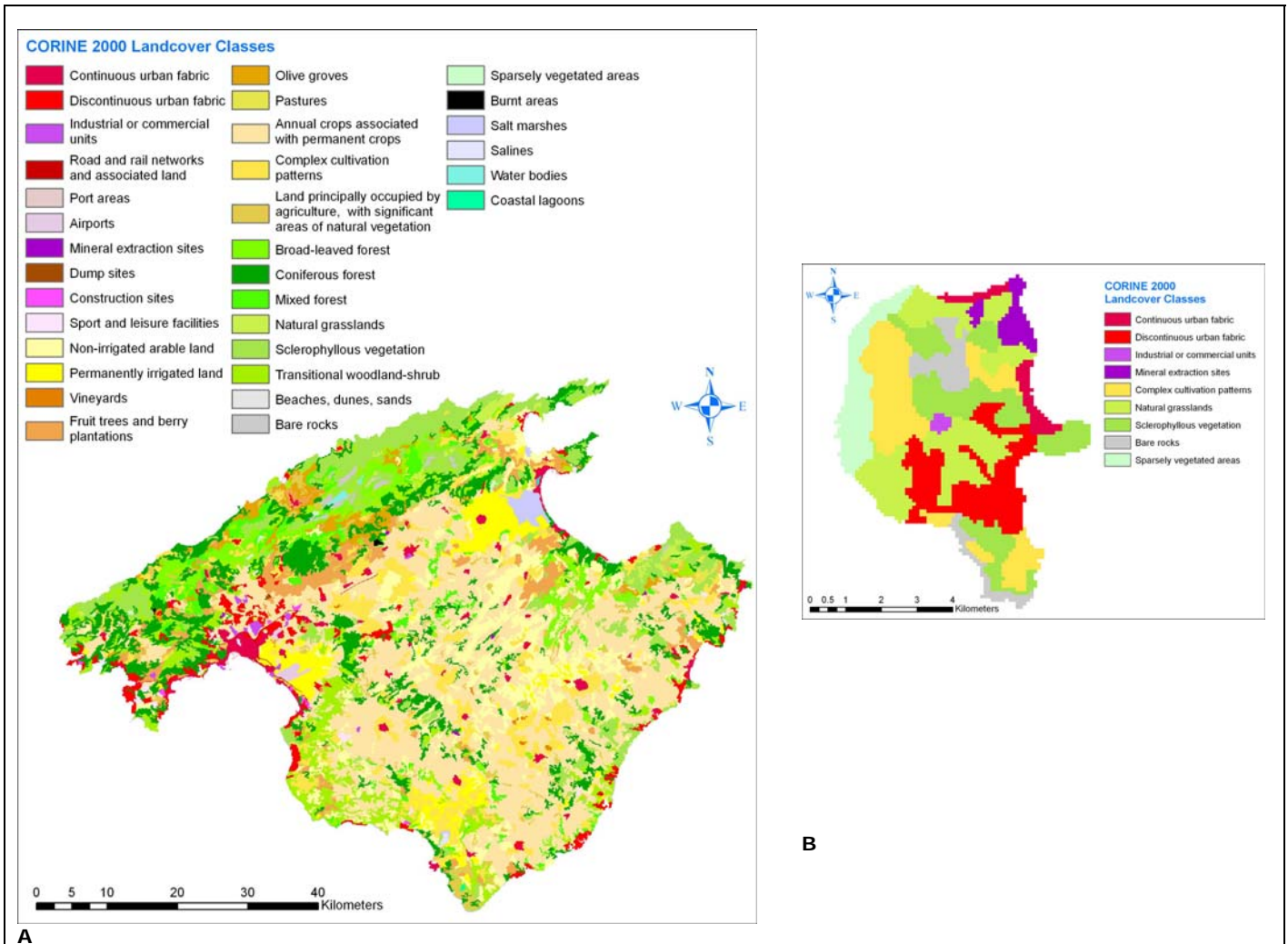
### *Fresh water availability*

Most of the islands, regardless their size, face overexploitation issues of their underground water, a fact that has put much stress on underground aquifers (Benoit and Comeau, 2005). The construction of dams and desalination plants has been a common response, but such interventions have created secondary environmental problems the most important of which are the prevention of the normal circulation of sediments that are vital for the preservation of beaches.

Malta is one of the islands with the most severe problems: there is no surface water and almost of all of the natural water is pumped and used for domestic purposes (72%). This had led to a rapid decrease of the annual rate of water replacement and thus increased demand for non-conventional water resources. Cyprus is another island facing serious water availability problems. In fact, a large part of the state budget is allocated to water supply and the construction of the relevant infrastructure. Illes Balears and Greek

islands<sup>25</sup> face the same problem that is addressed either by desalinization plants or by transfer of drinkable water by ship.

Figure S3.1.3: Land Cover of (a) Mallorca and (b) Lipari



### Sea and coasts

Artificial coasts are another indication of the human pressure: in Malta, the percentage of artificial coast is 41,8%, in Lipari 33,8%, in Sardegna 20,5%, in Mallorca 35,5% and in Cyprus 22,4% showing a high concentration of the human activities on the coast. On the rest of the islands the artificial coasts are less than 10% of the total coastline. In these coastal areas most of the tourism activity is concentrated and are at the same time increasingly exposed to a major risk of submersion and erosion, especially in the Eastern Mediterranean where the sea level rise is more important.

<sup>25</sup> In Greek islands there are 8 islands with desalinisation system and the government is planning to construct 16 more mainly in small islands. Dams have also been constructed to retain fresh water.

Figure S3.1.4: Land Cover of (a) Kalymnos and (b) Lipsi

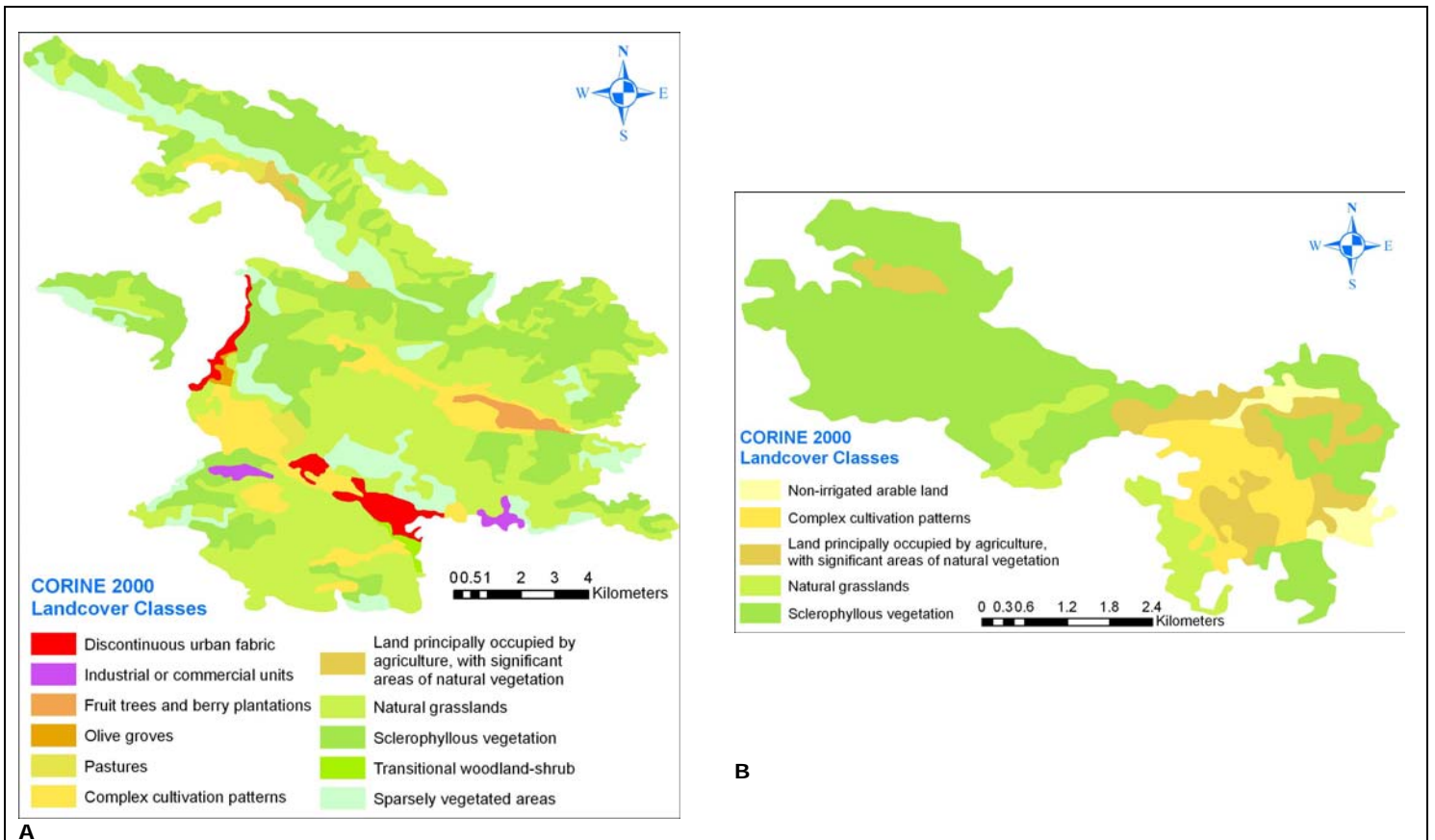


Figure S3.1.5: Land Cover of (a) Kokar and (b) Samsø

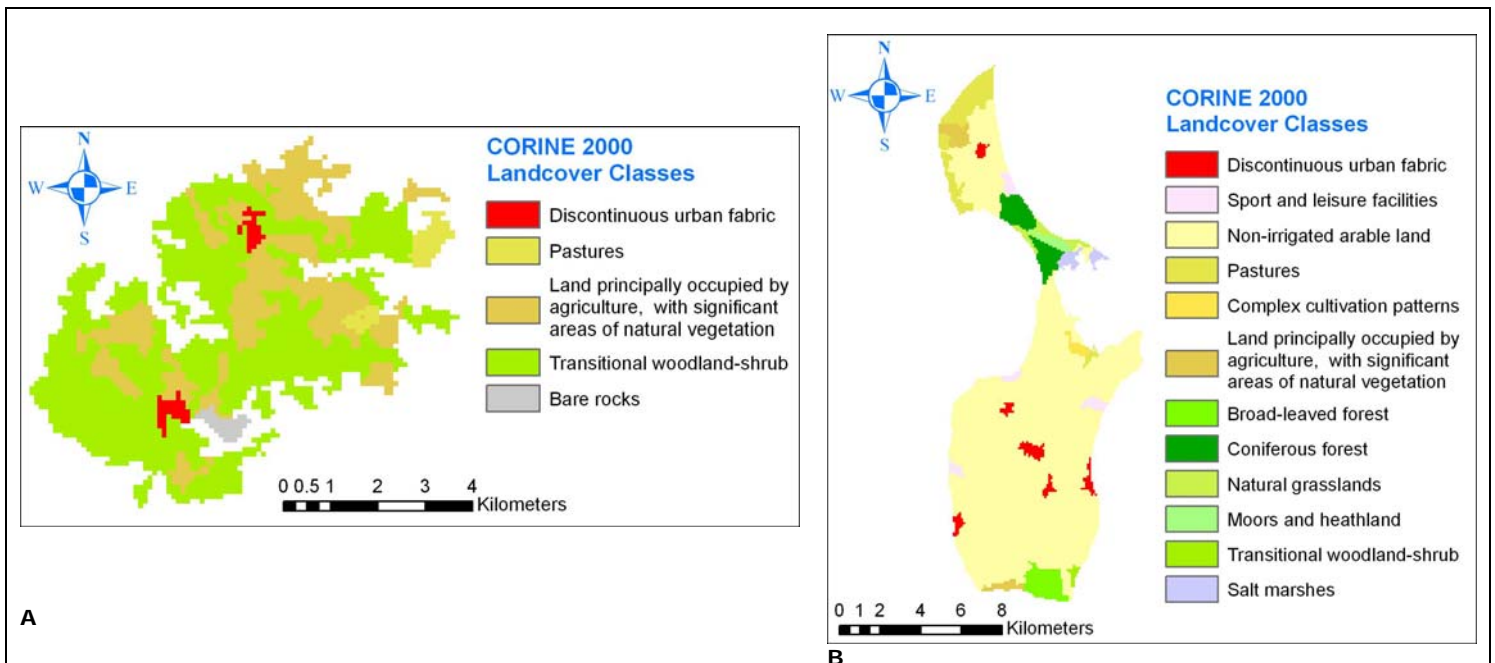
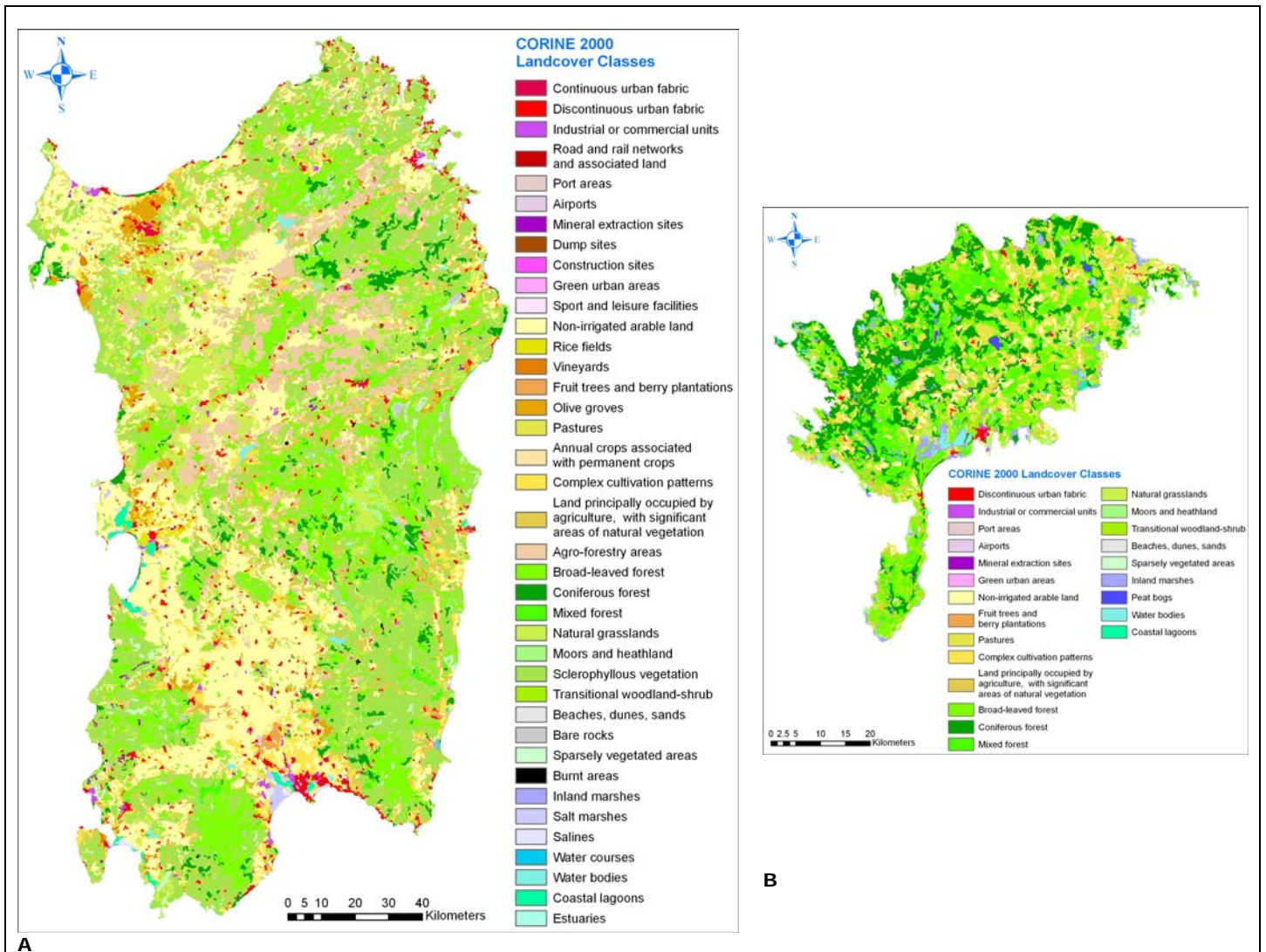


Figure S3.1.6: Land Cover of (a) Sardegna and (b) Saaremaa



The eastern part of the Mediterranean Sea is less productive than the western part (UNEP/MAP-Blue Plan, 2009). However, over the last few decades, Mediterranean ecosystems have experienced biodiversity changes due to climatic and environmental changes or to accidental introduction of exotic species. Observed changes in nutrient concentrations and ratios in the deep waters of the Western Mediterranean suggest that shifts have occurred in the relative distribution of nutrients and therefore probably phytoplankton species in all sea waters. The most significant pollution sources are industrial emissions, municipal waste and urban waste water, responsible for up to 80% of pollution in the Mediterranean Sea. Problems of sea pollution are very important in the northern seas and especially in the Baltic Sea where eutrophication is an important problem along with the collapse of the fishing stocks.

Concerning sea pollution, problems for all islands stem mainly from the European mainland and the sea transport than from the islands,

as for most of them the only pressure is from household and tourism waste as sewage treatment does not cover yet all settlements. Only in a few big islands industrial activity is found along with related problems.

### *Biodiversity*

The Mediterranean region is a zone of high endemism and considered as an important place for the global biodiversity (Benoit and Comeau, 2005). One of the factors behind this fact is the high fragmentation of habitats due to its relief and its many islands. Islands such as Kriti, Mallorca, Formentera, Lesvos, Corse together with Sicilia and Cyprus are considered as particularly rich in terrestrial and marine biodiversity. In general, this is reflected to the fact that on most of the islands some sort of protected areas are found, but these areas are larger in the Mediterranean covering from 20% to over 40% of the total surface and part of the NATURA 2000 network (ESPON, 2006b). On the contrary, the only insular region in North Europe with a high percentage of protected areas is Western Isles.

Today, this natural capital is under pressure from climate change, sea level rise, urbanisation, pollution, fires, agricultural practices, exotic species invasion, excessive fishing etc (UNEP/MAP-Blue Plan, 2009). An indication of this pressure is the fragmentation of the natural and semi-natural areas. The majority of the islands have low or intermediate levels of fragmentation with scores of 2 and 3 in a scale of 0-4, except Malta (ESPON Atlas 2006, p.46). The areas with the lowest level of ecological vulnerability are mostly in Europe's mountain regions.

### *Soil*

Desertification risk is a serious problem for the Mediterranean islands, as it is an irreversible trend with severe repercussions to their capacity for food production, water retention, biodiversity and generally for the conservation of ecosystem functions and services (see maps annex VI).

### *Landscape*

The landscape of islands is in danger from different pressures such as urban sprawl for the population and tourism, big scale infrastructure, real estate, forest fires, the abandonment or intensification of agriculture (e.g. greenhouses). Mediterranean islands are facing more pressures than Nordic ones and their traditional elements are neglected or destroyed (settlements, terraces, fences, paved footpaths, agriculture and animal husbandry infrastructure, rural constructions etc., Kizos et al. 2007).

### *Air pollution*

Air pollution is not reported as a problem in island regions; the main sources of pollution are from energy plants and a restricted number of "heavy" industries as well as from urban concentration: there are only two Metropolitan European Growth Areas (MEGAs) (La Valetta and Palma) and 12 Functional Urban Areas (FUAs) of transnational and national importance located on the 7 most populated islands (Corse, Cyprus, Rodos, Eivissa, Sardegna, Kriti, Sicilia).

Environmental problems in general seem to differ between the North and the South: urban sprawl due to tourism and holiday homes construction, coast artificialisation, water shortages, fires and high soil erosion risk are the principal problems to be addressed in the South; sea eutrophication and coastal erosion are the main problems in the North. A common problem seems to be fish stock collapse – more severe in the north- with direct repercussions on islands' economies and societies.

#### *Box 3: Main issues of the analysis on environmental conservation:*

- Population density varies from very low, especially in Northern Europe and some Notio Aigaio islands, to much higher than the EU average.
- Some islands (Malta, Gozo, Isle of Wight, Sicily and Lipari, Mallorca, Minorca and Bornholm) show relatively **high rates of artificialization**, as well as a **high rate of artificial coasts**, together with Sardegna, and Cyprus.
- Nearly *all islands face more or less serious problems of fresh water availability*
- *Sea pollution* (caused mainly by non island activities), *desertification and landscape degradation* are also serious concerns for all islands, the problems being more acute in the touristic Southern islands.
- Islands' natural environment -specially in the Mediterranean basin- is rich but *particularly vulnerable to human and other external pressures*

### **Input from the case studies**

The NUTS islands (Sardegna, Cyprus, Mallorca and Malta) differ from each other concerning their situation:

- **Mallorca** is the "leader" of EU islands due to its tourism industry, even if the two other Balearic Islands score higher in GDP per capita. The presence of a MEGA and of a significant university centre provides Mallorca with better perspectives compared to the other Balears. This dynamism affects the whole socio-economic system by attracting more activities and more



active population. But, this tourism mono-activity increases economic, social and environmental vulnerability.

- **Cyprus** –despite that an important part of the island is still under Turkish military occupation- seems to prosper with an economy based on two pillars: business services (off-shore companies, banking and shipping activities as Cyprus provides favourable tax regimes and other incentives) and tourism. This economic performance has a very positive impact on the demographics of the island. Its location into a geopolitically fragile area could be approached as a comparative advantage attracting activities from the neighbouring countries.
- **Sardegna**, despite its magnitude, has since the '90s poor and insufficient socio-economic results to sustain convergence with the EU. Its classification by ESPON within the areas having negative migration balance, especially for young people, underlines the difficulties. Policy measures aiming at developing the secondary sector and agricultural activities have not yet had the anticipated results as GVA structure reveals, while tourism activities have not shown significant dynamism either.
- **Malta's** socio-economic performance is not as high as required for converging with the EU average. The crisis in manufacture has not been "absorbed" by the service sector (mainly tourism); but part time work (especially for women) and a low active population keep low unemployment levels.

Information for the non-NUTS islands is more disparate:

- **Kokar's** economy is based on sea activities (50% of the employed) and is shrinking, challenging the ability to continue offering basic services. Population is also declining and ageing.
- Recent trends for **Lipsi and Kalymnos** (1991-2001) seem to improve after a long period of economic decline due to the crisis of fishing activities (sponge, tuna) and the abandonment of agriculture. The active population rate is still very low (mainly for women) and today fisheries and construction (for second homes) are the main activities.
- On **Saaremaa** the evolution of employment was particularly negative during the 90s with a decrease of 40% and a stabilisation afterwards.
- **Lipari** has low employment (40,7%) and high unemployment rates (9,1%) and an economy oriented towards services (78,3% of the employed and 80,7% of the GVA) based on tourism. The population increase is very low (6% during 1977-2006).
- **Samso**: The public sector is the main economic activity, employing 35% of the active population, another 12%, in telecommunications and transport. The primary sector and HORECA are also important employers (16% and 17% respectively). The population is steadily decreasing and ageing

in the last 50 years, as young people migrate and the natural balance is negative. These findings lead to a mitigated image for the island's development.

#### *3.1.4. Synthesis on the State of Islands*

After presenting the available data for the variables defined in the methodology, two indexes are proposed to summarize these findings on island regions (see section 2.1.4):

- (a) A "**State index**", for the situation of the islands in comparison with the member states they are located in and the EU;
- (b) A "**Change index**", capturing changes that have taken place during 2000 – 2006, depending on the availability over time of the series of the particular indicators used.

The **State** index is calculated twice with the use of five indicators:

- (f) GDP per capita 2006 (EU 27=100);
- (g) The active population / total population % that is first transformed with the EU27=100 and then the classes are assigned to the values;
- (h) The unemployment rate % in 2008 that is first transformed with the EU27=100 and then the classes are inverted to keep the overall scale of the values of the indicator already discussed above;
- (i) The percentage of population older than 65 in 2007, which is first transformed with the EU27=100 and then the classes are inverted to keep the overall scale of the values of the indicator already discussed above.
- (j) The percentage of artificial land to the total land from the CORINE data base in 2000, with the EU27=100 and then the classes are inverted.

The **Change** index is calculated with the use of three indicators:

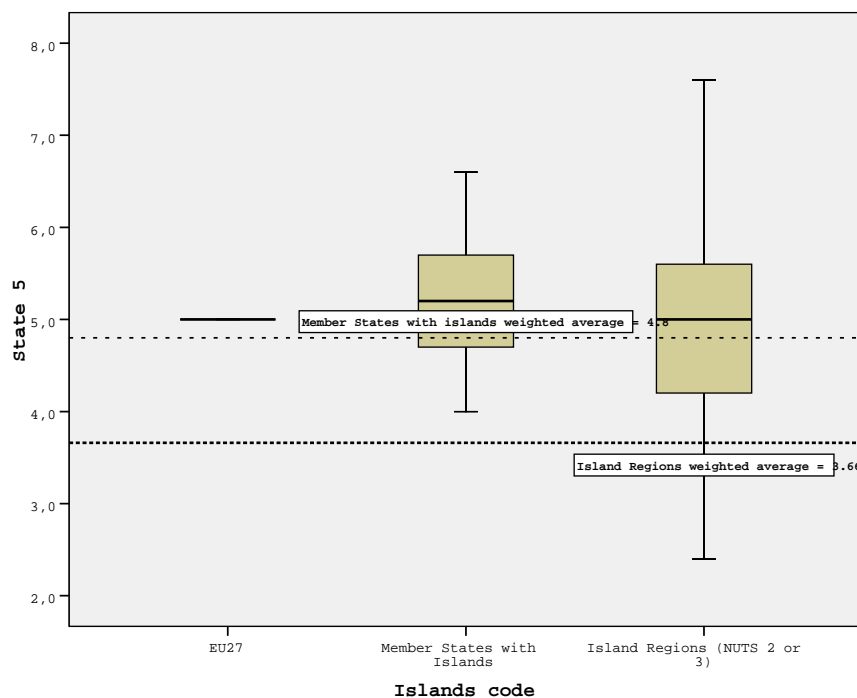
- (d) population change 2000 - 2006 % that is first transformed with the EU27=100 and then the classes are assigned;
- (e) The GDP per capita with the EU27=100 change % 2000 – 2006, where the classes are assigned to the values;
- (f) The active population change % 2000-2006, which is first transformed with the EU27=100 and then the values of the indicator are assigned.

A summary of descriptive statistics for the indexes is presented in Table S3.1.3.

Table S3.1.3: Descriptive statistics for State 4 and State 5 Indexes, GDP/capita and Change Index

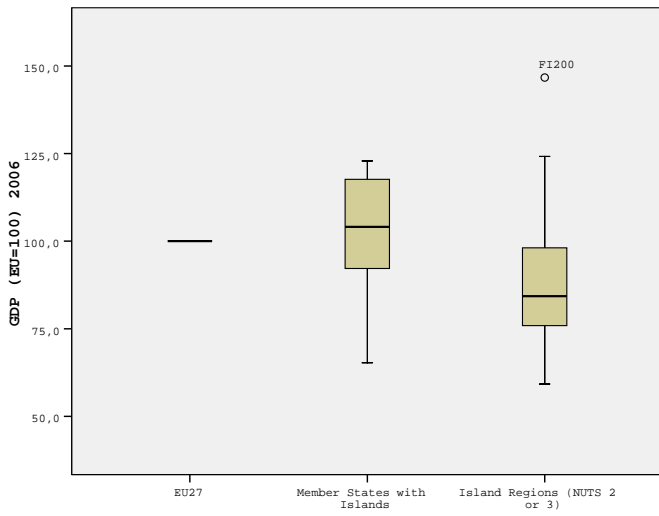
Islands code		GDP (EU=100) 2006	State 5	Change index
EU27	N	1	1	1
	Mean	100,0	5,0	5,0
	Median	100,0	5,0	5,0
	Minimum	100,0	5,0	5,0
	Maximum	100,0	5,0	5,0
Member States with Islands	N	11	11	11
	Mean	102,1	5,2	5,6
	Median	104,1	5,2	6,3
	Minimum	65,3	4,0	2,3
	Maximum	122,9	6,6	8,0
Island Regions (NUTS 2 or 3)	N	26	26	26
	Mean	88,7	4,9	5,1
	Median	84,3	5,0	5,0
	Minimum	59,2	2,4	2,0
	Maximum	146,7	7,6	8,3

Graph S3.1.5: Box Plot of the state index for Member states with islands and island NUTS 2 and 3 regions against the EU27 average

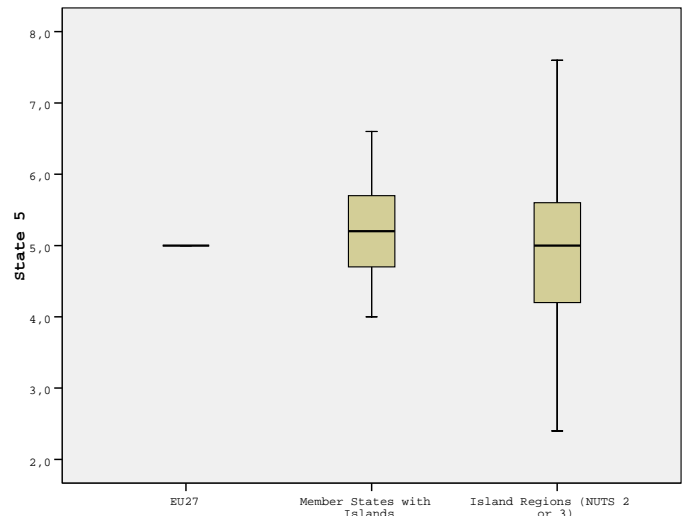


The findings of the State index demonstrate clearly that the **average of the island regions is lower than that of the EU-27, but also lower than the average of the States with island regions**. The variance within the island regions is higher than that of the Member States with islands, with some cases significantly higher (up to 7) and some as low as 2. The variance is higher also when we compare the State5 index with the GDP index (Graph S3.1.6).

Graph S3.1.6: Boxplots of GDP/capita and State Index for NUTS 2 or 3 island regions and Member States with islands

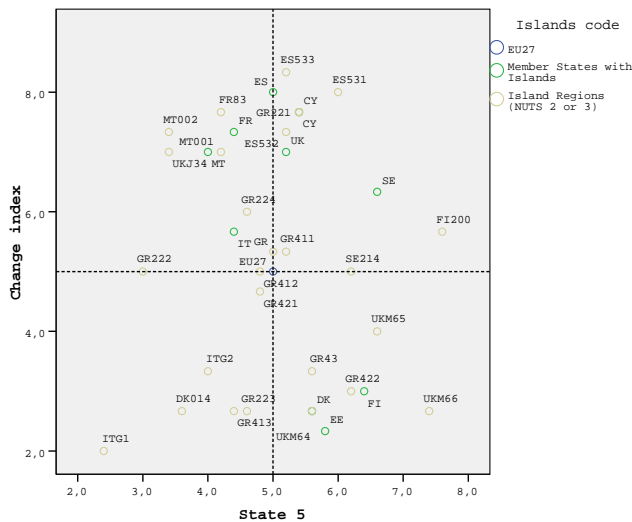


A. GDP /capita (2006)

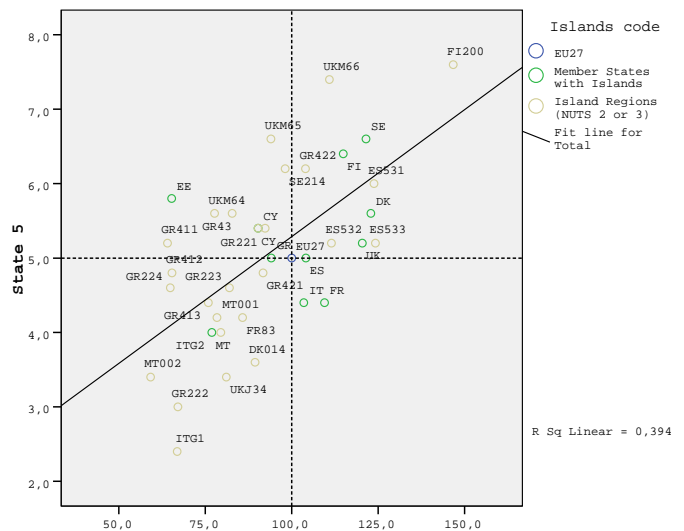


B. State Index

Graph S3.1.7: Scatterplots of State Index, GDP/capita and Change Index for NUTS 2 or 3 island regions and Member States with islands



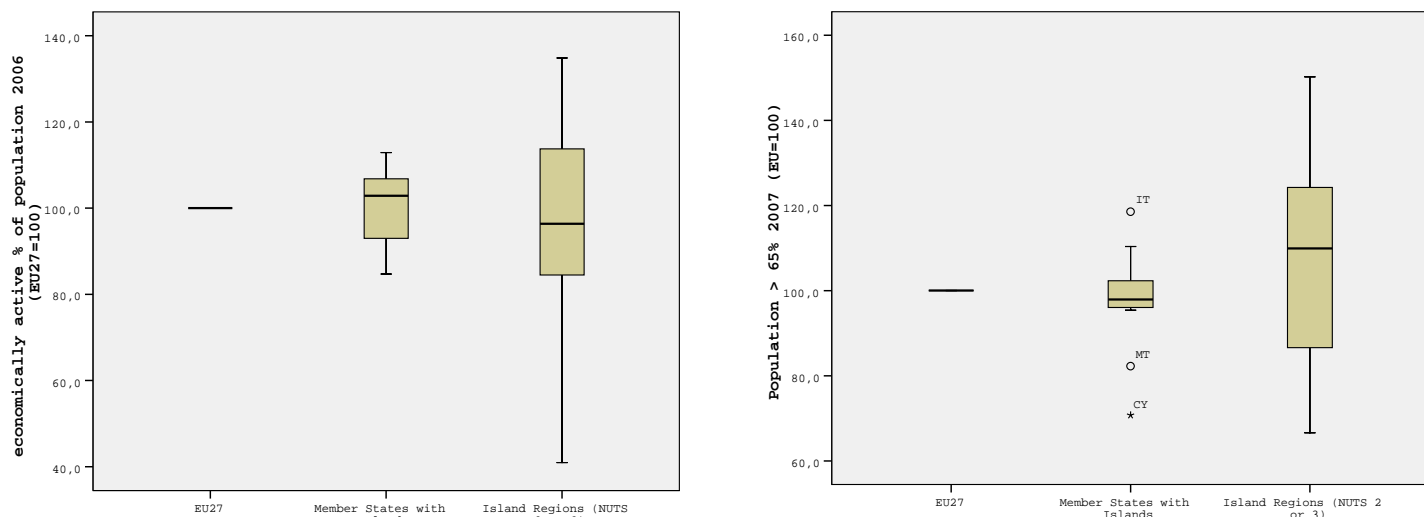
A. Change Index and State Index



B. State Index and GDP/capita

The GDP/capita median for island regions is lower than EU-27 and the one of Member States with islands. These differences are smoothed out in the State index which reaches the EU and the Member States value. The variance of the GDP/capita values for island regions is not very high (except Åland), but increases significantly for the State index. The values of the two variables are correlated (Graph S3.1.7B). Concerning the % of population over 65 years, the values for island regions present a significant variance, much higher than that of the Member States with islands. The same is also true for the percentage of the economically active population (Graph S3.1.8).

Graph S3.1.8: Boxplots of Economically active % of population and Population > 65% of total for NUTS 2 or 3 island regions and Member States with islands

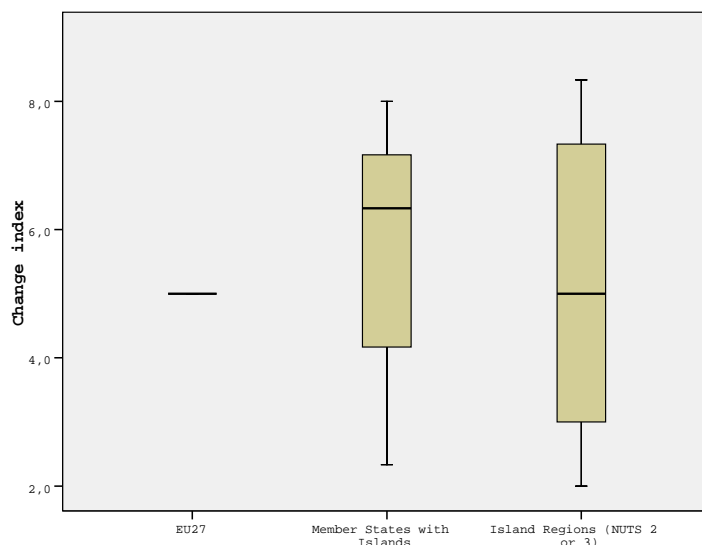


A. Economically active % of population (EU27=100)

B. Population > 65% of total (EU27=100)

The findings for the change index **underline a recent dynamism** – a global trend for islands- as more island regions have better scores than the EU27 average but not as high as the Member States with islands. But, this performance was not **strong enough to reduce the development gap between European islands** and the european mainland (as islands started from a comparatively low level).

Graph S3.1.9: Boxplot of Change Index for NUTS 2 or 3 island regions and Member States with islands



Map S13: State index for Island-states, NUTS 2 and NUTS 3 islands

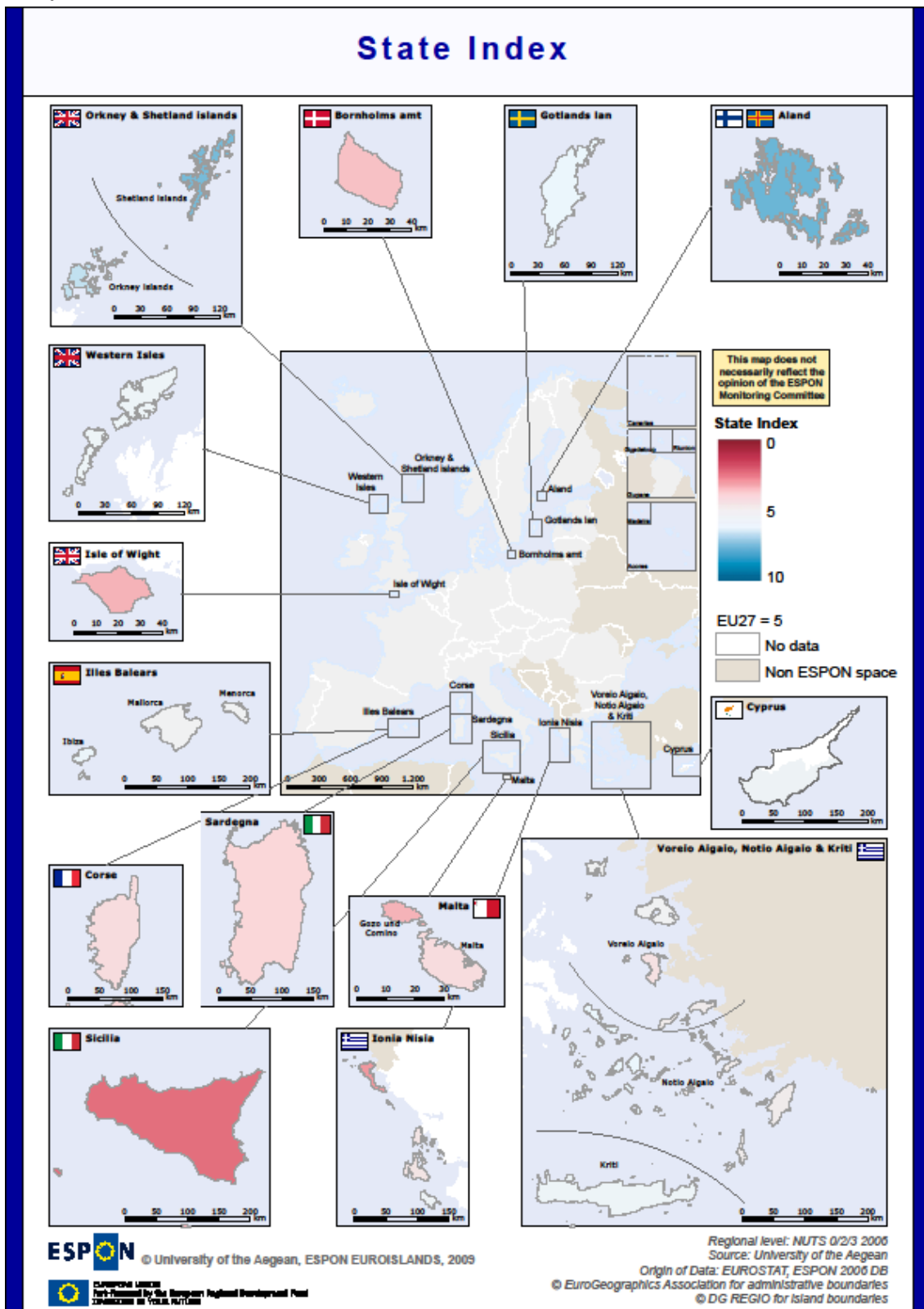


Table S3.1.4: Indicators, classes and calculation of the State Index

Geo name	GDP (EU=100) 2006	GDP (EU=100) 2006 classes	economically active % of population 2006	economically active % of population 2006 (EU27=100)	economically active % of population 2006 (EU27=100) classes	Population > 65% 2007	Population > 65% 2007 (EU=100)	Population > 65% 2007 (EU=100) classes	Population > 65% 2007 (EU=100) inverse classes
CY Cyprus	90,3	4	48,5	101,9	5	11,9	70,7	2	8
DK Denmark	122,9	7	53,7	112,9	6	16,5	97,9	5	5
DK014 Bornholm	89,4	4	49,3	103,7	5	19,8	117,7	7	3
EE Estonia	65,3	2	51,1	107,5	6	17,1	101,5	5	5
ES Spain	104,1	5	48,9	102,9	5	16,7	99,0	5	5
ES53 Illes Balears	114,4	6	53,0	111,5	6	13,7	81,5	3	7
ES531 Eivissa y Formentera	123,8	7	56,3	118,5	7	11,2	66,6	2	8
ES532 Mallorca	111,5	6	52,4	110,2	6	14,1	84,0	3	7
ES533 Menorca	124,2	7	54,2	114,0	6	13,4	79,7	3	7
FI Finland	114,9	6	50,3	105,7	6	16,5	97,9	5	5
FI20 Åland	146,7	9	54,1	113,8	6	16,9	100,8	5	5
FR France	109,5	6	44,6	93,8	4	16,3	96,6	5	5
FR83 Corse	85,8	4	32,3	67,8	2	19,9	118,2	7	3
GR Greece	94,1	4	43,8	92,2	4	18,6	110,4	6	4
GR22 Ionia Nisia	73,9	2	43,1	90,7	4	21,1	125,6	8	2
GR221 Zakynthos	92,3	4	55,0	115,6	7	17,8	105,6	6	4
GR222 Kerkyra	67,1	2	46,0	96,8	5	20,5	122,0	7	3
GR223 Kefallinia	82	3	19,5	40,9	1	24,1	143,5	9	1
GR224 Lefkada	64,9	1	45,7	96,2	5	25,3	150,2	9	1
GR41 Voreio Aigaio	67,4	2	38,6	81,2	3	21,9	130,4	8	2
GR411 Lesvos	64,1	1	45,6	95,9	5	22,1	131,7	8	2
GR412 Samos	65,4	2	32,2	67,8	2	22,6	134,5	8	2
GR413 Chios	75,9	3	29,6	62,2	1	20,9	124,5	7	3
GR42 Notio Aigaio	96,2	5	41,5	87,3	4	15,3	90,8	4	6
GR421 Dodekanisos	91,7	4	40,2	84,5	3	13,1	78,1	3	7
GR422 Kyklades	104	5	43,9	92,4	4	19,0	112,8	6	4
GR43 Kriti	82,8	3	45,9	96,6	5	17,3	103,0	5	5
IT Italy	103,5	5	41,8	88,0	4	19,9	118,6	6	4
ITG1 Sicilia	66,9	2	34,6	72,8	2	18,2	107,9	6	4
ITG2 Sardegna	79,5	3	41,1	86,4	4	18,0	106,8	6	4
MT Malta	76,9	3	40,3	84,7	3	13,8	82,3	3	7
MT001 Malta	78,4	3	40,8	85,7	4	13,8	81,9	3	7
MT002 Gozo and Comino	59,2	1	35,0	73,6	2	14,6	86,6	4	6
SE Sweden	121,5	7	52,5	110,4	6	17,4	103,2	5	5
SE214 Gotlands län	98,1	5	53,8	113,2	6	18,9	112,3	6	4
UK United Kingdom	120,4	7	50,5	106,1	6	16,0	95,4	5	5
UKJ34 Isle of Wight	81,1	3	43,5	91,5	4	22,8	135,5	9	1
UKM64 Eilean Siar (Western Isles)	77,7	3	56,0	117,7	7	20,9	124,2	7	3
UKM65 Orkney Islands	94	4	56,6	119,1	7	18,8	111,9	6	4
UKM66 Shetland Islands	110,9	6	64,1	134,8	8	16,2	96,4	5	5
European Union (27 countries)	100	5	47,6	100,0	5	16,8	100,0	5	5

Table S3.1.4: (continued): Indicators, classes and calculation of the State Index

Geo name	Unempl- oyment total % 2008	Unempl- oyment total % 2008 (EU=100)	Unempl- oyment total % 208 (EU=100) classes	Unempl- oyment total % 208 (EU=100) classes inverse	Artificial land (2000)	Total area	Artificial land % of total land (2000)	Artificial land % of total land (2000, EU27=100)	Artificial land % of total land (2000, EU27=100) inverse classes	State 4	State 5
CY Cyprus	3,7	52,9	1	9	68775	923056	7,5	178,7	1	6,5	5,4
DK Denmark	3,3	47,1	1	9	308733	4282331	7,2	172,9	1	6,8	5,6
DK014 Bornholm	6,7	95,7	5	5	3542	58640	6,0	144,9	1	4,3	3,6
EE Estonia	5,5	78,6	3	7	91318	4344961	2,1	50,4	9	5,0	5,8
ES Spain	11,3	161,4	9	1	831694	50587566	1,6	39,4	9	4,0	5,0
ES53 Illes Balears	7	100,0	5	5	26966	498195	5,4	129,8	2	4,5	4,0
ES531 Eivissa y Formentera	8	114,3	5	5	3266	65302	5,0	119,9	3	6,8	6,0
ES532 Mallorca	6,8	97,1	5	5	19862	363555	5,5	131,0	2	6,0	5,2
ES533 Menorca	7,3	104,3	6	4	3838	69338	5,5	132,7	2	6,0	5,2
FI Finland	6,4	91,4	4	6	467687	33760974	1,4	33,2	9	5,8	6,4
FI20 Åland	2,2	31,4	1	9	2623	143461	1,8	43,8	9	7,3	7,6
FR France	7,8	111,4	6	4	2657451	54874701	4,8	116,1	3	4,8	4,4
FR83 Corse	8,2	117,1	7	3	15431	871736	1,8	42,4	9	3,0	4,2
GR Greece	7,7	110,0	6	4	285084	13133410	2,2	52,1	9	4,0	5,0
GR22 Ionia Nisia	8,5	121,4	7	3						2,8	2,2
GR221 Zakynthos	8,7	124,3	7	3	934	40334	2,3	55,5	9	4,5	5,4
GR222 Kerkyra	10,5	150,0	9	1	2228	62623	3,6	85,3	4	2,8	3,0
GR223 Kefallinia	1,7	24,3	1	9	1023	89600	1,1	27,4	9	3,5	4,6
GR224 Lefkada	5,7	81,4	3	7	483	35000	1,4	33,1	9	3,5	4,6
GR41 Voreio Aigaio	4,5	64,3	1	9						4,0	3,2
GR411 Lesvos	4,4	62,9	1	9	2767	213608	1,3	31,1	9	4,3	5,2
GR412 Samos	2,6	37,1	1	9	742	77023	1,0	23,1	9	3,8	4,8
GR413 Chios	6	85,7	4	6	460	89894	0,5	12,3	9	3,3	4,4
GR42 Notio Aigaio	8,1	115,7	7	3						4,5	3,6
GR421 Dodekanisos	10,1	144,3	9	1	4857	267078	1,8	43,6	9	3,8	4,8
GR422 Kyklades	3,9	55,7	1	9	4626	255736	1,8	43,4	9	5,5	6,2
GR43 Kriti	6,3	90,0	4	6	12720	830784	1,5	36,7	9	4,8	5,6
IT Italy	6,7	95,7	5	5	1425966	30124997	4,7	113,5	4	4,5	4,4
ITG1 Sicilia	13,8	197,1	9	1	124373	2570487	4,8	116,0	3	2,3	2,4
ITG2 Sardegna	12,2	174,3	9	1	66372	2409530	2,8	66,1	8	3,0	4,0
MT Malta	6	85,7	4	6	8150	27822	29,3	702,5	1	4,8	4,0
MT001 Malta	6,1	87,1	4	6	6729	22165	30,4	728,0	1	5,0	4,2
MT002 Gozo and Comino	5,5	78,6	3	7	1421	5657	25,1	602,4	1	4,0	3,4
SE Sweden	6,2	88,6	4	6	604793	44932251	1,3	32,3	9	6,0	6,6
SE214 Gotlands län	5,8	82,9	3	7	5578	316567	1,8	42,3	9	5,5	6,2
UK United Kingdom	5,6	80,0	3	7	1812430	24424942	7,4	177,9	1	6,3	5,2
UKJ34 Isle of Wight	5,2	74,3	2	8	4164	38029	10,9	262,6	1	4,0	3,4
UKM64 Eilean Siar (Western Isles)	6,3	89,9	4	6	881	306770	0,3	6,9	9	4,8	5,6
UKM65 Orkney Islands	2,6	37,5	1	9	838	100568	0,8	20,0	9	6,0	6,6
UKM66 Shetland Islands	2,3	32,8	1	9	961	144873	0,7	15,9	9	7,0	7,4
European Union (27 countries)	7	100	5	5	18001045	4,32E+08	4,2	100,0	5	5,0	5,0



Table S3.1.5: Indicators, classes and calculation of the Change Index

Geo name	Population change rate 2000-06%	Population change rate 2000-06% (EU27 =100)	Population change rate 2000-06% (EU27 =100) classes	Active change 2000-6%	Economically active 2000-6 change rate%	Economically active 2000-6 change rate% (EU27 =100)	Economically active 2000-6 change rate% (EU27 =100) classes	GDP/capita 2000 (EU27 =100)	GDP/capita 2006 (EU27 =100)	GDP/capita change 2000-6 % (EU27 =0)	GDP/capita change 2000-6 % (EU27=0) classes	Change index
CY Cyprus	1,4	496,1	9	21,1	3,0	406,7	9	88,5	90,3	1,8	5	7,7
DK Denmark	0,2	82,2	3	2,6	0,4	50,4	1	131,4	123,3	-8,1	4	2,7
DK014 Bornholm	0,2	82,8	3	0,9	0,1	18,3	1	99,7	89,5	-10,3	4	2,7
EE Estonia	-0,2	-83,3	1	3,6	0,5	70,1	2	23,6	41,5	76,2	9	4
ES Spain	1,2	419,7	9	19,8	2,8	382,4	9	96,9	104,2	7,4	6	8,0
ES53 Illes Balears	2,4	859,1	9	29,9	4,3	575,6	9	119,4	114,4	-5,0	5	7,7
ES531 Eivissa y Formentera	3,5	1227,5	9	26,6	3,8	512,3	9	112,8	124,2	11,4	6	8,0
ES532 Mallorca	2,4	827,3	9	30,2	4,3	581,3	9	120,7	111,4	-9,3	4	7,3
ES533 Menorca	2,0	686,0	9	32,1	4,6	618,1	9	118,5	124,2	5,6	7	8,3
FI Finland	0,2	76,3	3	2,3	0,3	43,7	1	116,8	114,8	-1,9	5	3,0
FI20 Åland	0,5	187,7	9	4,3	0,6	83,2	3	145,5	147,0	1,5	5	5,7
FR France	0,5	192,6	9	9,9	1,4	190,6	9	115,2	109,7	-5,4	4	7,3
FR83 Corse	1,5	536,6	9	37,0	5,3	712,6	9	86,9	86,0	-0,9	5	7,7
GR Greece	0,3	92,8	4	6,0	0,9	114,9	6	83,8	94,1	10,3	6	5,3
GR22 Ionia Nisia	0,9	323,0	9	3,9	0,6	74,5	2	74,9	74,2	-0,7	5	5,3
GR221 Zakynthos	0,5	181,8	9	25,6	3,7	492,9	9	93,2	92,4	-0,8	5	7,7
GR222 Kerkyra	1,5	518,1	9	-0,2	0,0	-3,4	1	72,3	67,4	-4,9	5	5,0
GR223 Kefallinia	0,1	34,9	1	-41,3	-5,9	-795,6	1	71,2	82,2	11,0	6	2,7
GR224 Lefkada	0,2	80,1	3	72,9	10,4	1405,1	9	59,2	64,8	5,7	6	6,0
GR41 Voreio Aigaio	-0,2	-79,1	1	10,2	1,5	196,6	9	59,2	67,4	8,2	6	5,3
GR411 Lesvos	-0,2	-64,9	1	14,6	2,1	281,9	9	56,5	64,0	7,4	6	5,3
GR412 Samos	-0,3	-100,1	1	20,0	2,9	385,6	9	60,7	65,3	4,5	5	5,0
GR413 Chios	-0,3	-90,7	1	-7,8	-1,1	-150,1	1	62,8	75,8	13,0	6	2,7
GR42 Notio Aigaio	0,3	110,8	6	1,3	0,2	24,7	1	97,4	96,2	-1,2	5	4,0
GR421 Dodekanisos	0,4	147,3	9	-0,4	-0,1	-7,4	1	97,9	91,9	-6,0	4	4,7
GR422 Kyklades	0,1	48,1	1	3,8	0,5	74,1	2	96,3	104,2	7,9	6	3,0
GR43 Kriti	0,2	82,9	3	1,1	0,2	20,4	1	77,5	83,1	5,6	6	3,3
IT Italy	0,4	153,5	9	4,6	0,7	88,9	4	116,8	103,8	-12,9	4	5,7
ITG1 Sicilia	0,1	26,4	1	-2,2	-0,3	-42,5	1	73,6	66,9	-6,7	4	2,0
ITG2 Sardegna	0,2	56,3	1	4,9	0,7	95,0	5	88,0	79,7	-8,3	4	3,3
MT Malta	0,5	162,0	9	6,6	0,9	127,4	8	83,2	77,1	-6,1	4	7,0
MT001 Malta	0,4	150,0	9	6,5	0,9	126,0	8	84,8	78,4	-6,4	4	7,0
MT002 Gozo and Comino	0,9	305,0	9	7,6	1,1	146,9	9	64,9	59,3	-5,6	4	7,3
SE Sweden	0,3	103,0	5	9,2	1,3	177,7	9	126,2	121,6	-4,6	5	6,3
SE214 Gotlands län	0,0	0,0	1	12,0	1,7	230,5	9	98,4	98,3	-0,1	5	5,0
UK United Kingdom	0,4	146,0	9	6,2	0,9	119,9	7	118,8	120,3	1,5	5	7,0
UKJ34 Isle of Wight	0,7	240,3	9	6,3	0,9	122,4	7	79,6	81,4	1,8	5	7,0
UKM64 Western Isles	-0,2	-81,8	1	-18,8	-2,7	-362,2	1	67,5	78,0	10,4	6	2,7
UKM65 Orkney Islands	0,3	101,8	5	-2,5	-0,4	-47,7	1	85,9	94,1	8,2	6	4,0
UKM66 Shetland Islands	-0,2	-66,7	1	1,8	0,3	34,7	1	96,9	111,0	14,2	6	2,7
EU (27 countries)	0,3	100,0	5	5,2	0,7	100,0	5	100	100,0	0,0	5	5,0

### ***3.2. Analysis of Attractiveness parameters***

The second question of the analysis concerns **“the causes which have led to the current situation.”** The overall context links the existing situation of the area (representing the “effect”) with its level of attractiveness (representing the “cause”). The content of this link is examined in this section. More specifically, the impact of insularity to several attractiveness parameters is approached by distinguishing between attractiveness for businesses and attractiveness for population. Since regional attractiveness has been explored in previous EU studies a lot of parameters have already been identified (Table S3.2.1).

In the following paragraphs:

1. The relation between Insularity and Attractiveness parameters is presented;
2. The measurement of attractiveness variables is attempted;
3. The perception of the islanders about the relative importance of the different parameters of attractiveness is examined;
4. Finally, three attractiveness indexes are presented.

#### ***3.2.1. Insularity and Attractiveness***

Once the list of *Attractiveness parameters* was established, a causal relationship between them and *Insularity* was explored; it is important to identify which parameters of attractiveness are influenced **directly** and **permanently** by the characteristics of insularity and if this relation is negative or positive. In Table S3.2.1 the type of relationship (+ for positive and – for negative) and the intensity of this relation is presented:

- The **Small Size** of the islands’ population (always compared with the european mainland) as well as the small local market influences negatively the development of agglomeration economies, economies of scale and agglomeration dynamism on islands, which is a necessary condition to stay competitive in national and global markets. Small also limits the availability of resources; increasing the vulnerability of islands to natural hazards.
- Additionally, the small size results in fragmented demand from the population and the few and small enterprises. This demand is not satisfied at all or at the same level as in the european mainland by public services; since construction and operational costs per capita are significantly higher. Services by private operators are provided only if they are profitable and this is feasible only in bigger islands.

- **Isolation and Remoteness** add up to low demand and influence negatively the accessibility of islands, but affect positively natural richness.
- **Small size, isolation and remoteness** make people feel safer on islands.

Other parameters of attractiveness are not directly influenced by insularity but they are either the indirect results of the particular historical development of different islands or the result of external global socio-economic and environmental forces.

Table S3.2.1: Attractiveness parameters and influence of insularity

	<b>Attractiveness Parameters</b>	<b>Direct influence by insularity</b>
1	<i>Accessibility</i>	---
2	<i>Public and Private services to business and population</i>	--
3	<i>Agglomeration economies</i>	---
4	<i>Environmental and cultural heritage</i>	+++
5	<i>Feeling of safety - Security</i>	++
6	<i>Natural and technical hazards</i>	+ / 0
7	<i>Labour qualification</i>	No direct influence
8	<i>Information society</i>	No direct influence
9	<i>Research and Innovation</i>	No direct influence
10	<i>Social capital</i>	No direct influence
11	<i>Governance Quality</i>	No direct influence
12	<i>Employment opportunities</i>	No direct influence

Source: TPG

### 3.2.2. Measurement of attractiveness parameters

Attractiveness parameters are measured and compared against the European mainland, but comparisons between islands are also performed.

#### 3.2.2.1. Accessibility

According to the ESPON study (ESPO Atlas, 2006, p. 34), "the 'core' of the European territory and the 'periphery' are concepts based on the idea of "accessibility". Under this perspective, geography and physical distance are very crucial parameters when referring to accessibility in terms of infrastructure and transport services. This means that it is rather difficult for a European peripheral area to have a good accessibility index when far away from the European Pentagon (London-Paris-Milano-München-Hamburg). This situation may appear better when considering accessibility by air, where the existence of an airport -and particularly an international one- improves access possibilities. The

accessibility of a peripheral area cannot be improved rapidly, as geographical distance and frequency of scheduled trips are also very significant parameters. Therefore, "peripherality" is considered as a permanent geographical feature and the fact that some of these peripheral regions are islands should be taken into account.

Considering islands, since most of them are located in the geographical periphery of Europe and that entails long trip durations, the lowest level of accessibility is expected for almost all of them within Europe. Additionally, on most of them and particularly on the smaller ones, airports do not exist, so they can only be accessed by sea which makes the accessibility of these islands even more problematic.

The evidence of the above can partially be seen in Table S3.2.2<sup>26</sup>. Comparisons of the accessibility index between different island NUTS 2 & 3 regions and regions in the European mainland regions reveal that the potential accessibility by road and by rail distorts islands' reality. Neither the additional time needed to go to an island by ship is taken into account (e.g. island of Gotland and Gavleborgs Lan region on the Swedish mainland, with the same distance from Stockholm, have the same accessibility by road) nor the fact that islands do not have railway networks and their access to a rail station requires long trips (e.g. Satakunta in West Finland with a dense railway network has the same value of accessibility by rail as the archipelago of Åland with no rail network at all) are taken into account. For Cyprus the situation is even worse as there is no more ferry link for abroad; so the only way to travel in continental Europe is by plane.

The same is true for the potential accessibility by air, where, besides the existence of an airport in a NUTS 3 area, the proximity of that area to an international airport should be taken into account (e.g. Zakynthos (Ionia Nissia) with 2 domestic flights per day during winter has a score of 76 and Voiotia –one hour distance by car from the international airport of Athens- has 55).

Using the overall multimodal accessibility index overestimates islands' accessibility since its values are 90% dependent on the air accessibility indicator. More specifically, the multimodal accessibility index does not take into account: (a) the transport of goods; (b) the inhabitants of islands that have to travel from their residence to other places (islands or european mainland) for different reasons such as work, health, shopping, business, administrative affairs, education and training, entertainment etc. for which reasons the

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<sup>26</sup> The accessibility approach is based on the ESPON 2006 program's study "Transport services and networks" and the data are from ESPON DataBase.

daily accessibility is very important, even not necessarily by air as not all islands have airports; (c) the rest categories of population that when travelling to and from islands care more about frequency, trip duration and cost than about daily accessibility.

Table S3.2.2: Comparison of the ESPON multimodal accessibility index between island NUTS 2 & 3 regions and selected european mainland regions

NUTS 3 area	By Road	By Rail	By Air	Multi-modal Index
Gavleborgs Lan (SE)	12	15	47	44
Satakunta (FI)	11	11	50	46
<b>Cyprus</b>	<b>5</b>	<b>4</b>	<b>56</b>	<b>51</b>
Indre (F)	98	102	35	53
<b>Gotland (SE)</b>	<b>12</b>	<b>12</b>	<b>77</b>	<b>70</b>
<b>Gozo and Comino (MT)</b>	<b>11</b>	<b>10</b>	<b>77</b>	<b>71</b>
<b>Irakleio (GR)</b>	<b>5</b>	<b>4</b>	<b>78</b>	<b>71</b>
<b>Corse-du-Sud (F)</b>	<b>24</b>	<b>22</b>	<b>79</b>	<b>73</b>
Královehradecký (CZ)	94	82	73	73
Lungau (DE)	103	73	72	74
<b>Åland (FI)</b>	<b>12</b>	<b>12</b>	<b>82</b>	<b>76</b>
Perugia (IT)	91	65	75	76
Ille-et-Vilaine (FR)	85	100	74	77
<b>Messina (IT)</b>	<b>34</b>	<b>29</b>	<b>82</b>	<b>77</b>
<b>Dodekanisos (GR)</b>	<b>4</b>	<b>4</b>	<b>87</b>	<b>79</b>
<b>Kerkyra (GR)</b>	<b>22</b>	<b>20</b>	<b>86</b>	<b>80</b>
Bolzano-Bozen (IT)	129	113	71	80
Oost-Groningen (NL)	134	134	67	80
<b>Cagliari (IT)</b>	<b>10</b>	<b>9</b>	<b>91</b>	<b>83</b>
<b>Malta Island (MT)</b>	<b>10</b>	<b>9</b>	<b>91</b>	<b>83</b>
Elbe-Elster (DE)	127	114	82	86
<b>Bornholm (DK)</b>	<b>32</b>	<b>47</b>	<b>102</b>	<b>94</b>
Ardennes (FR)	164	145	83	94
Oostende (BE)	158	156	89	98
<b>Mallorca (ES)</b>	<b>19</b>	<b>17</b>	<b>108</b>	<b>99</b>

Source: ESPON Database

**In Bold type: Island NUTS 2 & 3 Regions;** Regular type: mainland regions

Despite the above shortcomings and the subsequent fact that the multimodal accessibility index overestimates the accessibility of islands, the data demonstrate that **all islands are below the European average (100)**; only two of them -Mallorca and Isle of Wight – are very close to the European average (Map S14).<sup>27</sup>

<sup>27</sup> These conclusions are reconfirmed by the first outputs of the ESPON 2013 program, as only Catania (Sicilia) is present (for 2009) on the map of "city network for one-day business trips (linked only with Rome) and only Illes Balears are above the ESPON average in Potential Multimodal Accessibility for 2006 (ESPON, 2010, New Evidence on Smart, Sustainable and Inclusive Territories, p.37 & 39)

The above analysis effectuated at the NUTS 3 level, it's not reflecting the reality of archipelagos as the index concerns only the main island where the airport and the main port are located; for instance the situation is not the same in Mariehamn and Kokar (Åland Islands), in Rodos and Lipsi (Dodecanisos), in Mallorca and Formentera (Illes Balears). The situation of "double insularity" creates handicaps that are not comparable to any situation on the mainland as the access to transport services is not related only to physical distance but also to the trip schedule of a public service. Variables used to measure accessibility as "number of passenger flights available within a 90-minute journey by road" (EU, 2009, p.8) are irrelevant for archipelagos.

Figure S3.2.1 provided by the EURISLES project is closer to the reality of islands (EURISLES, 1996 and 2002). The assumption made was that most of the passengers and goods are transferred by sea and the real time required to reach the island regions from the European centre (symbolised by Maastricht) was calculated (travel time by road, crossing time by ferry, waiting time and a frequency coefficient). This approach has to be enriched with air transport.

In general, accessibility for islands is quite high only within the limits of the island, as in this case transport is as "easy" and at approximately the same cost, as in the European mainland. In islands with large populations, where the majority of services mentioned previously (health, education, administration etc.) are offered locally, the necessity of "overseas" travel is less necessary and frequent. In a few cases -where an island is very close to another big island or to the European mainland and the corresponding service is available- the population can commute every day even for school or job needs. This is the case for instance in the Archipelagos of Stockholm and Uppsala Counties, in Aigina and Salamina (close to the port of Athens - Piraeus), Iles aux Moines (Brittany), and Gozo among others.

Map S14: Accessibility of European Islands (ESPON Multimodal Accessibility index - 2001)

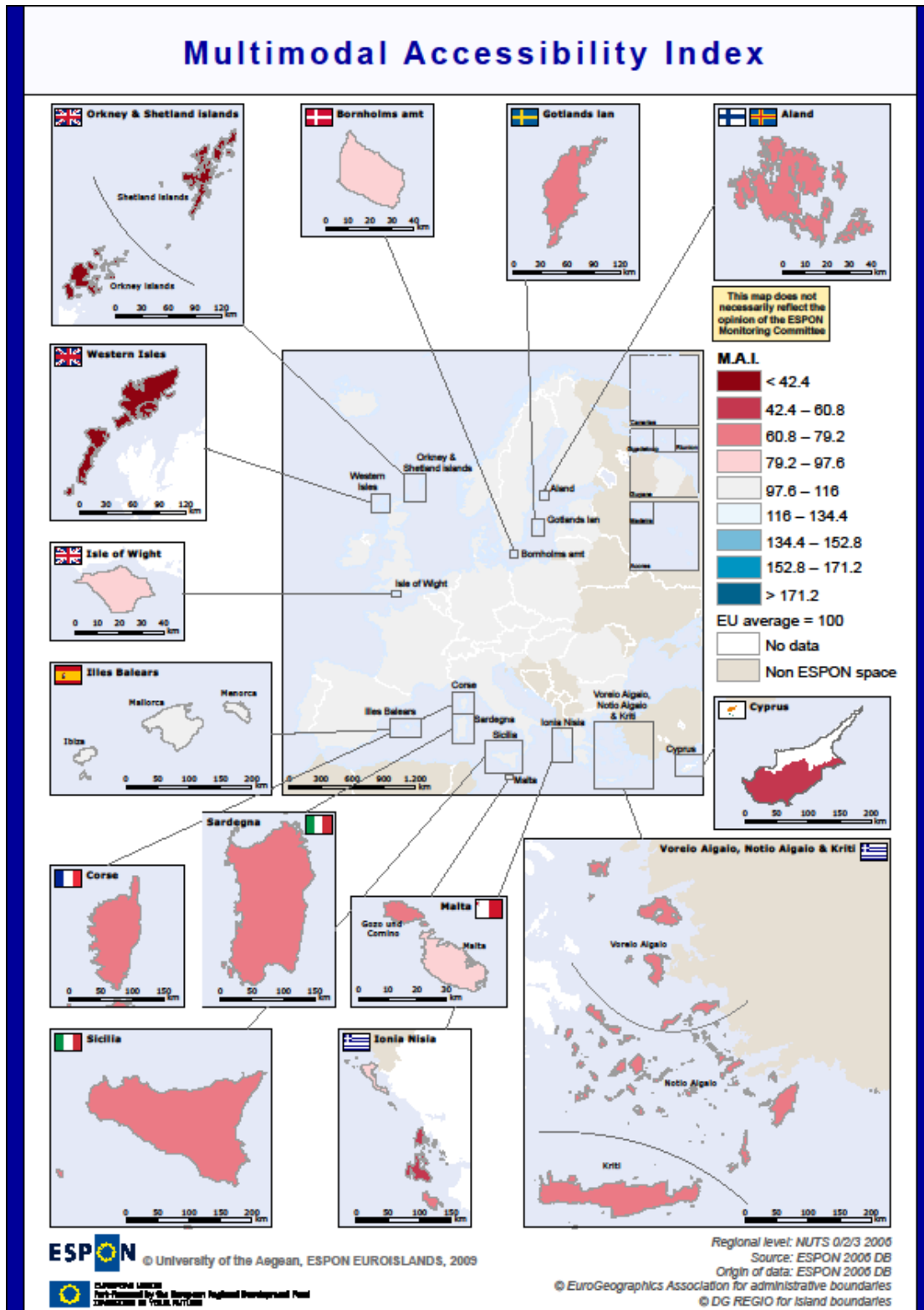


Figure S3.2.1: Accessibility of European Islands (EURISLES) – virtual distances of the islands from the centre of the EU



Source: EURISLES

Table S3.2.3: Accessibility of selected islands of the Dodecanisos (GR) 2009

Destination port	Departure port	Distance (km)	Travel time (h)	Number of connections	Total time (h)	Travel speed (km/h)	Virtual distance	Accessibility index
Pireas	Rodos	439	14,8	10	25,2	29,7	748,44	1,70
	Kos	346	11,6	10	22,0	29,7	653,40	1,89
	Kalimnos	315	11,8	4	34,8	26,9	936,12	2,97
	Leros	298	10,0	4	33,0	26,9	888,61	2,98
	Lipsi	283	10,5	2	54,5	26,9	1466,05	5,18
Rodos	Kalimnos	121	4	17	7,5	26,9	200,96	1,66
	Lipsi	160	5,4	8	16,9	26,9	454,61	2,84
Kos	Kalimnos	26	0,5	60	1,3	26,9	33,68	1,30
	Lipsi	66	2,5	14	6,0	26,9	161,40	2,45
Leros	Lipsi	20	0,8	14	4,3	26,9	115,67	5,78

At the same time, the inhabitants of the Greek islands of Lipsi and Kalymnos have to face a much more complex situation as they have



to travel to different destinations for different purposes (Table S3.2.3). The inhabitants of the small island of Lipsi (total 687) are offered a limited number of services locally and have to travel very often out of the island. If for example the mayor of Lipsi wants to travel to Brussels for a meeting of European mayors the shorter route involves ferry to Kos, flight to Athens and flight to Brussels and it would need more than a day if there is no interruption of the service (more often for the high speed boats) due to bad weather. The accessibility of the inhabitants of Lipsi to different destinations in order to acquire different Public Interest Services (Annex III Case Study of Kalymnos-Lipsi) is presented in the Map S15

In general, small islands in archipelagos also suffer from double insularity. The small islands transport connections link to larger islands, which enhance the problems of isolation in terms of time and money. The lack of coordination of the connections between both islands and between the larger islands and the continent exacerbate the limitations. Furthermore, there's usually a lack of competition in such transport markets, especially when it comes to connection between the smaller islands with less traffic. The lack of direct connections from islands to ports of other member states (as between Spain, France and Italy) is an additional problem.

Concerning the travel costs and durations of travel for the case study islands, some of the most important findings include:

A passenger ticket from **Lipsi** to Pireas (by ship) costs (in 2009) 53€<sup>28</sup> and the respective car ticket costs 111€, total 164€. For 4 persons and a car the total cost is 323€, or 80,75 €/person. The cost for covering the same distance of 283km on the European mainland by car reaches 28€ assuming that the car consumes 0,10 liters/km. Adding a cost of 6€ for the tolls, makes a total of 34€<sup>29</sup>.

The comparison is revealing: **the cost for one person by ferry is 4,8 times higher than the cost of travelling by car, while for four persons is approximately 9 times higher.** In terms of the time required, **the time of travelling by ferry is 54,5 hours (table 4), while by car it is 4 hours (with an average speed of 70 km/hour) or even less.**

A comparison can be made with a route of similar distance (290 km). It concerns the link between Eivissa (Illes Balears) and Barcelona (mainland). For a 9 hours travel (high speed boat) the

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<sup>28</sup> There are differences in prices between a conventional and a high speed ship.

<sup>29</sup> Even if many maritime lines are subsidised in Greece with a sum of about 100million €, this is not reflected to consumer prices.

price for one way trip): 4 passengers (all of them in the same cabin) plus car (height<1,80 meters) costs 356 euros. The price is changing to 454 euros if they use two cabins. It has to be taken into account that all the people living in the Illes Balears (residents) get a 50% discount when travelling to the mainland paid by the Government. This discount is applied only on the passenger not on the car. The prices shown already have this discount applied.

Map S15: Accessibility of Lipsi island to different Public Interest Services

### Lipsi island: Accessibility to services



ESPON  
 © University of the Aegean, ESPON EUROISLANDS, 2005

Regional level: NUTS 0 / 2005  
 Source: ESPON 2005 DIB  
 Origin of data: EUROISLANDS TPG  
 © EuroGeographics Association for administrative boundaries  
 © DG REGIO for island boundaries

#### Legend

- Virtual distance
- NON ESPON space
- ESPON space
- Case studies

**Samsø** is connected via ferry connections to Kalundborg in ZeÅland and to Hov in Jutland, 30 km from Aarhus, the 2<sup>nd</sup> largest city in Denmark. The journey to Jutland is normally scheduled with 7 daily departures. The journey takes one hour to Hov and the total travel time from Samsø to Aarhus amounts to two hours. The ship travel to ZeÅland takes almost two hours (for almost 20 nautical miles) and is scheduled with 2-3 daily departures depending on the season. The travel time to Copenhagen is around four hours. The cost for a single journey for a person amount 11,5€ (price-list of 2009/10) and 34€ for a car on the line to Jutland. The costs to ZeÅland amount 15€ and 72€ respectively. Citizens of the island travel for half price.

From **Kokar** to the Åland mainland there are 24 trips per week (from a minimum of 3 per day to a maximum of 4 per day) in the winter season; going up to 28 trips (4 per day) in the shoulder season; rising further to 32 trips in high summer (minimum of 3 trips per day on Saturday and Sunday; 6 trips on Friday and 5 trips on each of the rest of the week). The cost depends on the form of transportation: return fares from Långnäs (on the mainland of Åland) to Kokar are: 12€ (motorcycle); 23€ (car or trailer); 55€ (caravan/recreational vehicle); 65€ (car with trailer); and 110€ (coach/bus). The trip between Kökar and mainland Åland is free for passengers but not for vehicles. Residents of Kökar pay 45€/year/car, as the ticket is subsidized and the cost is financed with Åland tax revenue. Travel time takes from 2h 30 minutes to 2h 55 minutes each way, the latter being longer because of more ferry stops on other islands on the way to/from Kokar. Cruise ships going from Sweden to Finland enter the ports of Åland many times every day to benefit from the tax-free status of the Islands. Tickets are cheap since the revenue of the shipping companies mainly derives from sales and gaming on board. (e.g.: Helsinki-Mariehamn = 26€; Stockholm-Mariehamn = 11€ per passenger.)

The situation can be more extreme in very small islands like the Papa Westray Island in the archipelagos of **Orkney** (Scotland). The six teenagers that reside there take the flight every Tuesday morning from Papa Westray, stay with host families for two nights and then catch a return flight on Thursday after school. Pupils from either island choosing to study for their Highers must travel to Kirkwall, the capital of Orkney<sup>30</sup>.

The situation is completely different for Malta and Cyprus, or Corse and Mallorca, Sicily, Sardegna and Kriti, the **big islands**. First, these islands host an important number of services on their territory

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<sup>30</sup> Article in the Times on the 6/11/2009.

and second they offer frequent and quality air and sea transport services to other areas (other capitals, capital city, important commercial centres etc). But, even in these cases, the islanders have to use the public service (offered by public or private operators) with a fixed schedule and limited connectivity. In comparison, on the European mainland lorries and private cars can travel any time of the day and the cost is lower.

Concerning the cost of this service, it is generally higher than an equivalent distance for a public terrestrial service (EURISLES 1996 and 2002). In some countries and in specific cases (as in Kokar and Samsø cited above but also in Corsica where the principle of territorial continuity is applied), there are public policies that finance (partially or totally) the travel cost of the islanders.

Transport of commodities faces the same problems: limitation of choices, delays due to interruptions of loading and waiting time, high prices due to lack of competition, reduced and unbalanced flows (EURISLES 1996 and 2002).

Transport to/from the islands is still divided in national blocks, which impedes even more the full participation of islands in the internal market. The fragmentation of the internal market in the case of islands distorts competition at EU level. Thus, even if the Commission is trying to enhance the role of short sea shipping to promote a greener transport, sea links between the islands and the continent continue to be mostly cabotage. Domestic air links are promoted by the states, whereas inter-member state air traffic does not receive any attention. The fact that both maritime and air transport Public Service Obligations are regulated at national level and with no common EU criteria enhances the territorial gaps of the blue borders.

Therefore, islands are less favoured in terms of accessibility, compared to the continental mainland, for transport choice, travel time and costs. The situation *is even worse for small islands* as the case studies reveal: **more complex** (need to use many different means of transport to travel out of the island); **more costly; lengthier**. In archipelagic islands the situation is aggravated, as the permanent population of the very small islands needs to commute every day to receive basic services such as education, health, etc. The conclusion reached is that **insularity affects accessibility negatively for both islanders and visitors**.

### 3.2.2.2. Public, Private and Networking services to business and population

The existence and quality of services available to population and businesses of an island is an important attractiveness issue (confirmed by the questionnaires to residents that follow). These services are linked with accessibility as already mentioned. Accessibility to appropriate public interest services like health, education, social security, administration, energy, water, telecommunications, culture, transport, etc, for the whole of the European population was underlined by the European Spatial Development Perspective as a matter of social justice and as a *sine qua non* condition in order to stop the concentration of population within the Pentagon (Nordwijk 1997). Access to banks, accounting, marketing and engineering services has equal importance for economic activities.

Previous studies (EURISLES, 2002 and PLANISTAT, 2002) have insisted on the fact that population size is a crucial factor for availability of services on an island. The PLANISTAT study has demonstrated that a population of 4 to 5 thousand consists a key threshold for the provision of an important part of services locally, but there are "superior services" (e.g. hospitals, tertiary education, cinemas, laboratories for medical analysis among others) that are located only in a big regional city or in the capital.

In the case of small islands, the examples of the case study islands of this study demonstrate the differences of the services located on them and the extremely important role of accessibility for each island (Table S3.2.4). During the interviews with local stakeholders the necessity for a more flexible administrative system that could meet islands' realities and population's aspirations was underlined.

Table S3.2.4: Existence of Public and Private Services on small case study islands

	Pharmacy	Hospital	Bank	Tax service/ Social Security	Tertiary Education
<b>Kokar</b>	No	Only a Clinic. Need to travel to Mariehamn or Turku-Upsala	yes	No / Internet services	No. In Mariehamn-college Turku - Stockholm
<b>Lipsi</b>	No	Doctor + nurse. Need to travel to Rodos or Athens.	no	No / In Kalymnos	No, in other areas of Greece
<b>Samsø</b>	Yes	Small, threatened with closure. Need to travel to Aarhus	yes	Yes	No. Aarhus
<b>Kalymnos</b>	Yes	Yes	yes	Yes	No, in other areas of Greece

Source: fieldwork data

The case of an archipelago with many small islands is helpful: in Ponant islands (Brittany FR) an unusual school structure was

created with a school in 'the middle' that gave young islanders the opportunity to live on their small island and continue studying (Association of Ponant Islands, 2007). At the same study, an inventory of 19 basic public and private services on 13 islands with a population fluctuating from 111 up to 5.027 inhabitants was also created that revealed the different coverage of the islands and the importance of good transport services to the European mainland (these basic services are: Health (doctor, nurse, dentist, chemist, retirement home), education (primary, middle school), food (Bakery, butcher's shop, supermarket), other services (post office, hairdresser, café-bar, restaurant), leisure-culture (public library, village hall) and crafts-man (builder, electrician). This inventory showed the same results with a similar study for small Swedish islands (Gles et al., 2006) that had an equivalent but smaller check list: school, shop, pharmacy, postal service, cashier service.

Apart from these services, the existence and the quality of services offered by the different networks such as energy supply, water supply, solid waste management, sewage management, and transport network constitute a major challenge for islands. Factors such as the lack of appropriate land, the relief and the risk of polluting the limited resources add on the already high cost of constructing, maintaining and operating such small scale infrastructures.

As shown in the paper "Territories with specific geographical features" (EU, 2009), the problem of islanders' accessibility to some key services such as hospital and university is particularly acute: for 27,8% of them a hospital is located at more than 30' from their home when the European average is only 10,4%. Moreover, for 36,8% of the islanders tertiary education is located at more than 90' distance compared with the European average that is 7,4%. The particular situation of islanders compared to "European mainlanders" is that if a service is not provided ON an island, the cost in money and in time to access it is so disproportionately high compared to the cost on the European mainland that makes islanders to migrate to the European mainland, or to live on the island accepting a lower quality of life.

This problem is particularly important in the archipelagos and the small coastal islands as the existence of a service on an island has almost no effect to nearby islands as inter-island accessibility is generally low. At the same time, the existence of a service on an island does not necessarily entail the provision of good and complete services.

A very revealing example is that of the Dodecanese (NUTS 3 area) with 188506 inhabitants living on 16 islands: 4 hospitals operate on the bigger islands (Rhodos, Kos, Kalymnos, Leros) and small dispensaries on all other islands; 16 ports and 8 airports; but local population complains of low quality services. On the case study islands of Lipsi and Kalymnos residents have to go to Rhodos and even in Athens for health services. The existence of a "mobile" dispensary sailing around the islands providing basic services to local population improves the situation but does not provide "complete" (e.g. surgical operations) and "throughout the year" services.

On Kalymnos in particular (16.576 inhabitants), a port and an airport are located with respectively 5 flights and 4 ship connections with Athens per week. There are also local transport services with the other islands of the archipelago by a company owned by the municipality, plus services offered by private companies (mainly during the tourism period). Local population and local entrepreneurs complain (see the case studies) about insufficient services as they need 34,8, 7,5 and 1,3 hours to go to Piraeus, Rhodos and Kos respectively, while daily accessibility is not assured even between Kalymnos and Kos that are 26km apart.

The situation is worse in other smaller islands, with no airport and less maritime connections as it is the case of Lipsi. People from Kokar and Samso face similar problems and they are also "obliged" to travel longer than 30' minutes (2 or 3 hours) in order to find "full" hospital services and they are also obliged to spend the night there and return the following day<sup>31</sup>.

On the other hand the cost for the state to provide infrastructures and public interest services to all the islands of an archipelago, such as Notio Aigaio is very high. As the population of the whole region is 305,500 inhabitants (2007 estimation) dispersed in 48 inhabited islands, the need for infrastructure and the operational cost per capita is extremely high; if all the population was concentrated in one island, the needs should decrease spectacularly (Table S3.2.5).

Concluding, in terms of access to services, *islands are less favoured compared to the continental mainland* as far as the **distance from public and private services is concerned**. The size of the permanent population matters for the provision of services (reduces the per capita cost); it is much higher for small islands. The same is true for networks. The problem is more acute for the archipelagos islands since *the presence of a service on an island does not*

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<sup>31</sup> For details see the reports on the case studies in Annex III.

*have necessarily direct positive effects for nearby ones.* Consequently, basic public investments needed are huge, leaving little room for other type of investments.

**Table S3.2.5: Need in Basic Infrastructures in Notio Aigaio (2002)**

Type of infrastructure	Hypothesis of one island	Actual situation
<b><i>Transport infrastructure</i></b>		
Ports	3	50
Marinas	4	12
Fishing Ports	8	15
Airports	1	14
Heliport	4	23
<b><i>Education infrastructure</i></b>		
Primary schools	90	211
Secondary schools	58	83
<b><i>Health infrastructure</i></b>		
Hospitals	1	5
Health centers	10	11
Local Dispensary	0	37
<b><i>Environment Infrastructure</i></b>		
Waste Water Treatment Installations	8	35
Installations for Solid Waste Treatment	4	18
<b><i>Energy Infrastructure</i></b>		
Energy Production Factories	1	21

Source: National Statistical Office of Greece, Rotas 2006

### **3.2.2.3. Agglomeration economies / Size of the market**

Dynamic cities and urban regions are recognised as vital assets in regional development. A total of 1595 Functional Urban Areas (FUAs) with more than 20.000 inhabitants have been identified across Europe on the basis of commuter relations and employment areas. Some of them are of trans-national importance, the Metropolitan European Growth Areas (MEGAs, more than 70 in Europe, 47 of them with more than one million people); others have a trans-national, national, regional or local importance (ESPON, 2006, Potentials for polycentric development in Europe).

The importance of towns and cities lies in the agglomeration economies and economies of scale that develop due to the concentration of different activities and population, as well as in the competition between companies that helps to innovate and to keep prices low. The attraction of diversified activities and services for enterprises and population and dynamism related to cultural and social life are other important aspects of towns as well.



Table S3.2.5: Classification of Islands' Functional Urban Areas based on importance of their functions (2001)

REGION	NUTS3 CODE	FUA popu-lation	FUA dem	FUA tra	FUA uni	FUA dec	FUA adm	FUA tou	FUA man	FUA ave
NICOSIA	CY	250633	3	0	1	3	4	1	1	1,9
LARNACA	CY	160733	2	3	0	2	2	2	1	1,7
LIMASSOL	CY	71740	2	0	0	3	2	4	1	1,7
PAPHOS	CY	47198	1	3	0	2	2	3	1	1,7
ROENNE	DK007	35481	1	0	0	1	2	2	1	1
IBIZA	ES53	73724	2	2	0	0	2	4	2	1,7
PALMA DE MALLORCA	ES53	432113	3	3	3	2	2	5	2	2,9
MARIEHAMN	FI2	25776	1	1	1	1	2	3	1	1,4
AJACCIO	FR831	77287	2	1	0	0	2	4		1,5
BASTIA	FR832	76439	2	1	0	0	2	2		1,2
CORFU	GR222	39487	1	0	0	0	2	4	1	1,1
MITILINI	GR411	36196	1	0	1	1	2	2	1	1,1
KHIOS	GR413	23779	1	0	0	0	2	2	1	0,9
RODHOS	GR421	53709	2	3	1	1	2	4	1	2
ERMOUPOLIS	GR422	13400	1	0	0	0	2	4	1	1,1
IRAKLION	GR431	154801	2	3	3	1	2	4	1	2,3
IERAPETRA	GR432	23707	1	0	0	0	1	4	1	1
RETHIMNON	GR433	31687	1	0	2	1	2	2	1	1,3
KHANIA	GR434	53373	2	2	1	1	2	3	1	1,7
BARCELONA POZZO DI	ITA03	51945	2	0	0	0	1	1	1	0,7
MESSINA	ITA03	236183	2	0	3	0	1	3	2	1,4
MILAZZO	ITA03	52817	2	0	0	0	1	1	1	0,7
AGRIGENTO	ITA04	177245	2	0	0	0	1	2	1	0,9
SCIACCA	ITA04	63363	2	0	0	0	1	1	1	0,7
CALTANISSETTA	ITA05	154547	2	0	0	0	1	1	1	0,7
GELA	ITA05	159012	2	0	0	0	1	1	1	0,7
ENNA	ITA06	93963	2	0	0	0	1	1	1	0,7
ADRANO	ITA07	62039	2	0	0	0	1	1	1	0,7
CALTAGIRONE	ITA07	51098	2	0	0	0	1	1	1	0,7
CATANIA	ITA07	608249	3	0	4	0	1	2	2	1,6
GIARRE	ITA07	86130	2	0	0	0	1	1	1	0,7
MODICA	ITA08	107589	2	0	0	0	1	2	1	0,9
RAGUSA	ITA08	90318	2	0	0	0	1	1	1	0,7
VITTORIA	ITA08	91826	2	0	0	0	1	1	1	0,7
LENTINI	ITA09	59525	2	0	0	0	1	1	1	0,7
SIRACUSA	ITA09	258332	3	0	0	1	1	2	2	1,3
ALGHERO	ITB01	45127	1	1	0	0	1	1	1	0,7
OLBIA	ITB01	49671	1	0	0	1	1	1	1	0,7
SASSARI	ITB01	204440	2	0	3	1	1	3	2	1,4
NUORO	ITB02	80080	2	0	0	0	1	1	1	0,7
MACOMER	ITB02	22921	1	0	0	0	1	3	1	0,9
ORISTANO	ITB03	77149	2	0	0	0	1	1	1	0,7
CAGLIARI	ITB04	460774	3	0	4	1	2	3	2	1,9
IGLESIAS	ITB04	129103	2	0	0	1	1	2	2	1,1
VALLETTA	MT	388594	3	4	2	3	4	3	1	2,9
VISBY	SE094	57313	2	1	1	1	2	2	1	1,4

Source: ESPON 2006 Data Base, TPG calculations

FUApop: FUA population

FUAadm: FUA demography function

FUAtra: FUA transport function

FUAuni :FUA Knowledge function

FUAdec: FUA Decision making for the private sector function

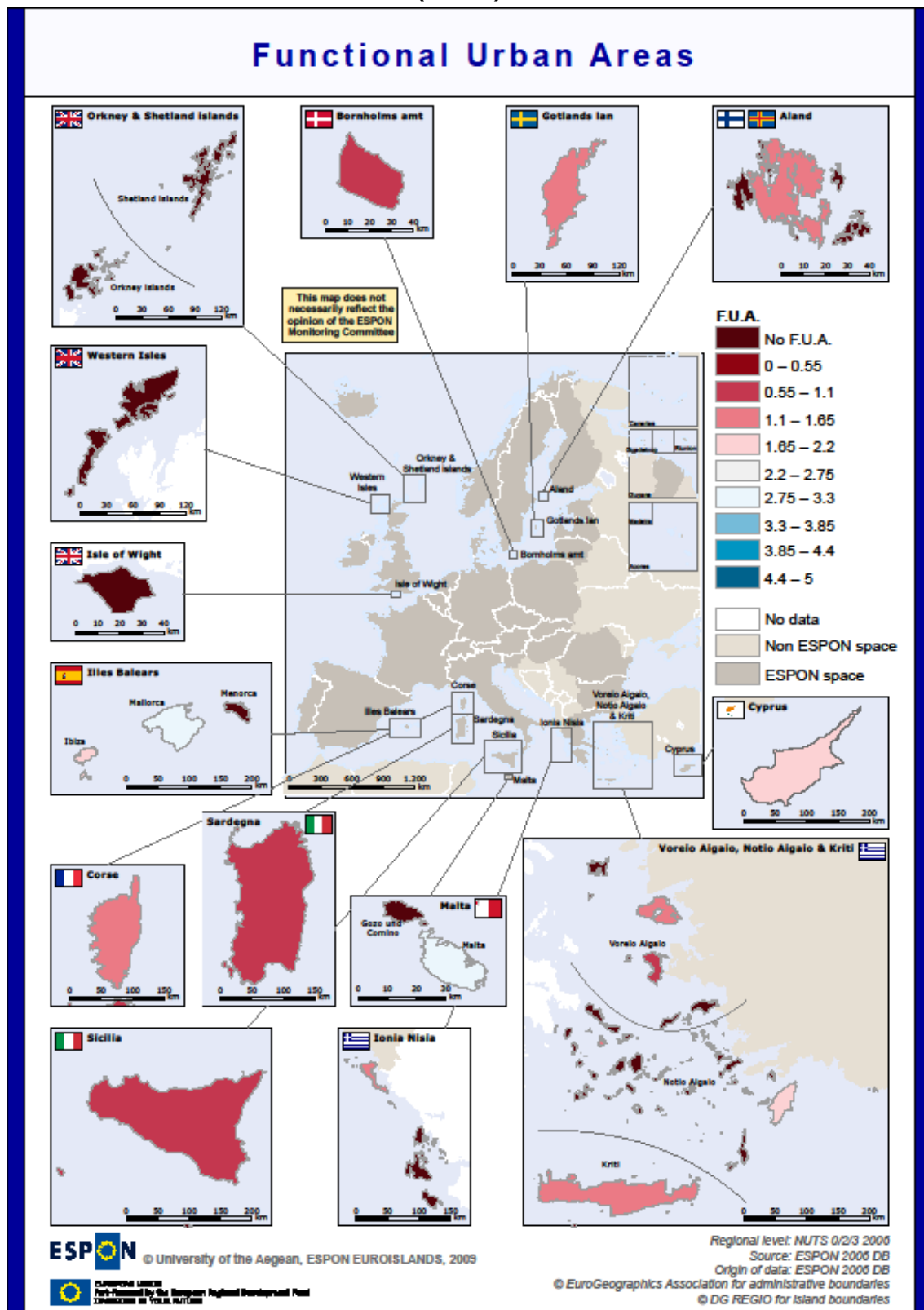
FUAadm: FUA Decision making for the public sector function

FUAtou: FUA Tourism function

FUAman: FUA Manufacturing function

FUAave: Averege of FUA's performance

Map S16: Urban Dynamics: MEGA & FUA functions' importance (2001)



On islands, La Valetta and Palma are the only two MEGAs (Table S3.2.5). They are considered as “weak” MEGAs, since they have limited functions and lower competitiveness especially in the fields of knowledge and innovation. 15 more FUAs of trans-national or national importance are located on 9 more islands. Their importance in population, in tourism, as transport nodes, in manufacturing, in knowledge process, and in decision making (both private and public) at the European level is presented in the Map S16. The island FUAs are mostly renowned for tourism: only Valletta is an important centre for transport, knowledge and public decision making, while Cagliari and Catania are considered as important knowledge centres for their universities.

Concluding, *islands are lagging behind compared to European mainland cities in terms of agglomeration economies*, since due to the population size and the small size of the market, economies of scale cannot be developed, diversification of activities and services is low, cultural and social life remains limited and therefore, urban dynamism conditions that enable the creation of FUAs and MEGAs cannot be met.

#### **3.2.2.4. Environmental and cultural heritage**

Environmental and cultural heritage are analysed as capital assets that can help the development of islands and enhance quality of life. It is a fact that many of the activities on islands rely on these resources (activities such as tourism, farming, fisheries, cattle-breeding, quarrying etc) and often constitute a mono-activity without alternatives. This results in high economic, social and environmental vulnerability.

As it is developed in paragraph 3.1.3, the environmental capital of the islands is particularly rich<sup>32</sup>, specifically this of the Mediterranean islands. The percentage of the surface under the NATURA 2000 is a good indicator for such estimation.

The analysis focuses also on **cultural heritage** (ESPON 2006c). Measurement or estimation is not easy and existing approaches place emphasis on the presence and density of cultural heritage (monuments, sites, events, landscapes etc.), **cultural infrastructures** (museums, theatres, galleries etc.), to the intellectual capital and the professionals of culture that can valorise the existing capital and produce new. Concerning the number of monuments and sites registered in islands, Gotland in the North,

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<sup>32</sup>

The same observation stands also for mountainous areas

Sicilia, Sardegna, Illes Balears and the Greek islands in the South, have the highest numbers (Annex I, Figures 4, 35, 37).

Culture employment is very low to all NUTS 2 Mediterranean islands, except Cyprus. Åland, following the trend of most of the Scandinavian regions have a high level of employment in **cultural professions**. Although cultural heritage is richer in the Mediterranean islands, cultural professions are more developed in the Nordic islands and in Nordic countries in general (Annex I, Figure 6). It has to be noticed that there a positive relationship between GDP per capita and the percentage of cultural employment has been detected from ESPON 2006 program (Annex I, Figures 10 & 11); an important exception has been registered: Illes Balears have a very low cultural employment.

Concluding, the presence of important ***cultural and natural assets specifically in the Mediterranean islands can be a very important advantage*** when an appropriate framework for these assets to be exploited in a sustainable way is developed; till now these assets are used as scenery for tourism development and often their preservation is considered as an obstacle for more intensive development. However their exploitation requires an adequate policy, suitable management and the corresponding human and social capital.

### **3.2.2.5. Feeling of safety - Security**

A final question examined the feeling of safety (e.g. in relation to crime) of the population measured on a 4 point scale question with the highest scores indicating lower levels of safety. According to the analysis, Illes Balears, Scotland and Sicily have the lowest levels (2.77, 2.27 and 2.24 respectively). The highest levels of safety were presented in North Aegean and Bornholms Amt (1.35 and 1.43 respectively). Regarding differences between North and South Europe no statistically significant differences were observed.

### **3.2.2.6. Natural and technical hazards**

The risk for natural and technical hazards was estimated during the ESPON 2006 program (ESPON 2006d) with 15 parameters (avalanches, drought, earthquakes, extreme temperatures, floods, forest fires, landslides, storm surges, tsunamis, volcanic eruptions, winter and tropical storms, air traffic hazards, major accident hazards, nuclear power plants and oil production, storage and transportation) that were weighted using the Delphi method.

The aggregate hazard typology gave a good score for islands compared to the european mainland as Corse, Cyprus, South East

Sicilia and all the Greek island regions face a medium risk (25-75 percentiles) and the rest of the islands face lower risks (Annex I, Figure 12, p.13). Important risks for these islands are emanating from droughts, forest fire, earthquakes, landslides, tsunamis, volcanic eruptions and oil transportation and storage.

### 3.2.2.7. Labour qualifications

Education, vocational training and lifelong learning play a vital role in the economic and social strategy of the European Union within the Lisbon process. Securing education and lifelong learning opportunities in every region and for all inhabitants has to be the cornerstone for national strategies.

The percentage of the total **population within the education system** in all levels of education is a key indicator. Many regions with higher scores than the European average (21,5% in 2007) are classified as less developed, e.g. Andalusia in Spain, Latvia, different Polish regions, French outer most regions, north Ireland as well as Sicilia, Kriti and Alland. The rest of the Greek islands as well as Cyprus, Malta and Sardegna have a student population between 18-21,5% but Corse and Balearics as well as Denmark have an even smaller percentage (lower than 18%, EUROSTAT Regional Yearbook, 2009, p. 114-123).

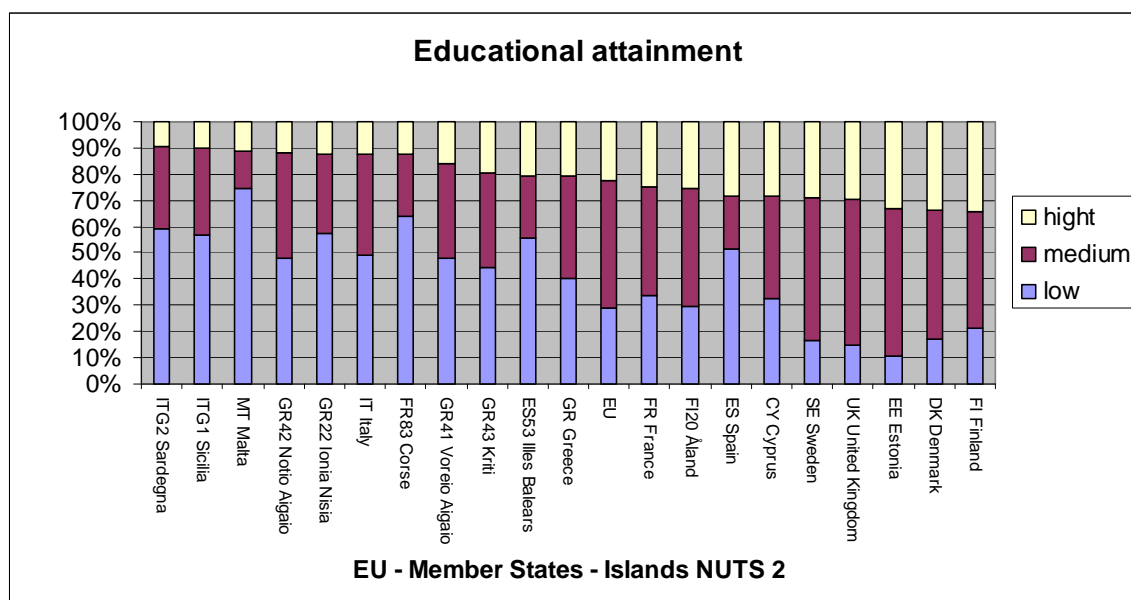
For students at **secondary and post-secondary not tertiary education** as a percent of the population aged 15-24, the situation is different: all Nordic countries (Åland included) as well as the Czech Republic, Hungary, Austria and Italy (Sardegna and Sicilia included) have a high score (more than 40% of the population aged 15 to 24); France and Greece (Corse and Greek islands included) have 30-40% and Spain (Balearics included), Malta and Cyprus less than 30%. The results are the same for tertiary education (% of students of 20-24) except for Kriti that has better results than the European average for the particular indicator.

The proportion of the population aged 25-64 years who has successfully completed **tertiary level education** is diverse across Europe, with the EU27 average at 22,4% (Graph 6): in the south, island regions with less than 20% are found except Cyprus (28,5%), while Sardegna, Sicilia, Notio Aigaio, Ionia Nissia, Corse and Malta have less than 12,5%;. In the north, most of the Nordic countries and island regions have more than 25% (on Åland 25,4%) of the population with a such a diploma.

These findings for island regions correlate with the share of the **population with low educational level** (with an EU27 average at

29,1%) that is high for almost all Mediterranean regions. In Malta the ratio is extremely high at 74,7%, where the other insular regions (Kriti and Illes Balears included) have a ratio between 45% and 60%, only Cyprus scores close to the EU average (32,6%, Graph 6 and Table AVII-4). Malta and Illes Balears have also very high percentage of early school leavers (37,2% and 36,8% respectively when the EU average is 14,9%); the Greek and the Italian Islands have also bad performance and only Åland (8,2%), Corse (13,2) and Cyprus (14,1) perform better than EU (EU, 2010). The high percentage of low educated population is also due to immigration, legal and clandestine; this population is attracted on islands as there is an important offer of low-skilled jobs in the construction sector, in tourism, in commerce, in agriculture, in personal services etc

Graph S2.3.1: Proportion of the population aged 25-64 years by educational level (2005)



Source: EUROSTAT web database, 2009; Tertiary level education is considered as "High educational attainment", upper secondary qualification is considered as "Medium educational attainment" and up to lower secondary qualification is considered as "Low educational attainment"

Finally, concerning **lifelong learning**, northern countries and island regions present higher scores than other regions with more than the EU average 9,3% of the population continuing refreshing their skills; In Åland this percentage is up to 24,8%!!!. On the contrary, most of the southern countries and island regions have less than 7% of their population within lifelong learning procedures (in greek islands is less than 2%!) with the exception of Spain, Illes Balears (8,6%) and Cyprus (8,5%) that have better scores (EUROSTAT, 2009 and EU 2010).

It appears therefore that there is a **shortage in the islands' human capital (e.g. competences, knowledge)** mainly in the Mediterranean ones: the educational attainment level is particularly low (compared with EU27 averages and national results) even on islands with a high level of GDP per capita and despite the presence of a University (Sicilia, Sardegna, Malta, Mallorca). This is the result of the type of economic development for these islands with a high level of GDP that is largely based on a low-knowledge activity: tourism. The presence of a University seems not enough to reverse this trend so far, as even high-skill graduates may face difficulties finding a job in the existing economic structures and may leave. Low trends of lifelong learning make the situation worse, undermining their competitiveness. On Nordic islands, human capital is better prepared to face new challenges.

### **3.2.2.8. Information society**

Information society has a double role on islands: firstly, directly contributing to GDP as a productive sector and secondly, indirectly affecting local productivity and ameliorating the accessibility of the population and of local businesses to different key services, such as financial services, education and training, general or targeted information, health and cultural services, commerce, personal contacts, distance work, especially for remote areas such as islands.

ICT's penetration has two different components: access to Internet and the capacity to use it; the first is related to the existing infrastructures and the latter to people's skills needed to participate to the information society (expressing the digital divide).

The level of **Information and Communication Technologies** penetration on islands varies significantly and is directly related to the corresponding national performance. At the European level, the use of ICT is higher in denser populated areas such as capital regions. Islands in north Europe have high percentage of households with broadband connections and their population uses the internet very often. On the contrary, Cyprus, Greek and Italian islands have very low penetration of ICT's. Malta, Illes Balears and Corse are situated in between.

The same pattern is observed for **e-commerce**: more than 55% of the population in Åland use internet for shopping while people in Corse and the Balears use it as much as the European average. Malta has the lowest score while the rest of the Mediterranean islands are classified among the European regions with the lowest use of this facility (lower than the EU average 15%) (EUROSTAT, 2009, Maps 7.1 & 7.2 Annex I).

The findings on ICT penetration follow a similar pattern as the labour qualification results, with the **Nordic islands performing better than the Mediterranean ones**. The “technology” gap causes lack of information and knowledge, factors that are necessary to achieve social equity and economic competitiveness.

### 3.2.2.9. Research and Innovation

Knowledge and innovation constitute one of the three main areas of action in the new Lisbon partnership for growth and jobs. The performance of the different areas is assessed through R&D expenditure, patents, employment in Science and Technology and in the medium and high tech manufacture. In islands, R&D is particularly important as it has to face insularity characteristics (small scale, environmental vulnerability and remoteness) and therefore the penetration of technology in low skilled societies as well as its adaptation to insularity is necessary.

The EU as a whole dedicates 1,9% of its GDP and 1,11% of the employment to R&D. In all islands, very low expenditure and human capital dedicated to R&D are recorded in comparison with EU average (Eurostat webdata base, 2009)<sup>33</sup> and only in one case (Kriti) R&D performances are better than the national ones: 0,94 % of the GDP and 0,84% of the human capital compared to 0,59% and 0,77% (2005); from the other regions Sicilia (0,8% and 0,6% respectively 2005), Malta (0,54% and 0,56% - 2008), Voreio Aigaio (0,48% and 0,39% 2005) and Sardegna (0,58% and 0,47% - 2005) have the highest involvement. In the contrary Åland (0,16% - 0,21% -2007) and Illes Balears (0,33% – 0,31% -2007) have particularly low involvement in R&D. Considering that the part of the private sector resources dedicated to R&D is lower than 0,2% (except in Malta where it is 0,4%) the assumption that research is concentrated in the Universities and in public research institutes is unavoidable. This is typical for Sicilia and Sardegna that are considered as knowledge nodes of European significance (ESPON Atlas, 2006, p.25 – EUROSTAT, 2009, Annex I, map 8.1).

The high performing regions of competitiveness and innovation present the same concentration for the Information Society Index as well. Illes Balears, Åland and Cyprus plus Kriti are performing better than other Mediterranean islands but are below European average (ESPON Atlas, 2006, p.24-27- Table S3.2.13). According to the Regional Innovation Performance Index for 2002-3 (EU 4<sup>th</sup> Report on Economic & Social Cohesion, 2007, p. 79) all

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<sup>33</sup> EUROSTAT data base has information for 2008 only at the national level; for regional level the information of the last available year is used



Mediterranean islands performed below the EU average (Illes Balears, Notio Aigaio and Voreio Aigaio recorded the poorest performance) where the Nordic Islands (or the European mainland region to which these islands are attached) performed above the average.

**All islands perform very poorly in R&D.** This is due to (a) the lack of significant Research Institutions located on the islands (lack of infrastructure) and (b) the low attractiveness of islands for highly educated and skilled people as they attempt to become part of the global knowledge economy. Among the Mediterranean islands, all of which are far below European average, Kriti, Sicilia, Malta and Sardegna perform relatively better than the rest since these islands have Universities and research institutes, which are the incubators for R&D Development.

### 3.2.2.10. Social capital

For assessing social capital on islands, the results of the European Social Survey have been used<sup>34</sup> (2003), with the main outcomes being:

#### *Social trust*

Three questions measuring social trust were combined in one quantitative variable. According to the results of the analysis differences of social trust between regions are statistically significant. In particular, several South European regions record the lowest, including Ionian Islands (mean score: -1.30), South Aegean (-0.87), Sicily (-0.69), Cyprus (-0.48) and Crete (-0.41). The highest levels of social trust are observed in Southern Finland and Åland (0.61), Bornholms Amt (0.59) and Illes Balears (0.42) (see Annex I). Statistically significant mean differences were also observed between South and North regions of the study. Northern regions present an average score of 0.54 whereas Southern regions have significantly lower levels of social trust (-0.43).

#### *Institutional trust*

Trust in institutions was investigated for three entities (Parliament, European Parliament, and Legal System) and was measured in one variable. One-way ANOVA tests recorded several statistically significant differences of means between regions (Annex I). Differences are significant between north and south European regions, with Southern areas having higher scores (South: 0.08, North: -0.10). Mean scores for each region reveal the highest levels in the Ionian Islands (0.53) followed by South Aegean and Cyprus

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<sup>34</sup> This Survey was not organised on a NUTS level and didn't cover all island regions or Member States such as Malta.

(0.32 and 0.25 respectively). On the other hand, Scotland (-0.65), Mediterranean (-0.47) and Illes Balears (-0.25) have significantly lower levels of institutional trust.

#### *Social networks*

Social networks were measured based on the number of organizations in which individuals are members or volunteers. One-way ANOVA tests reveal that several statistical differences between regions regarding the density of these networks. The highest mean score is presented in the area of Bornholms Amt (2.14) followed by Scotland (1.60) and Southern Finland (1.58). The majority of South European regions have significantly lower levels (Illes Balears: 0.05, Ionian Islands: 0.18, North Aegean: 0.41, Sardegna: 0.50, Sicily: 0.57, Crete: 0.59).

Similar results are observed for volunteerism, with lower scores on Balears and Ionian Islands where no respondents declared positive answers. The highest scores were noticed in Bornholms Amt (0.79) and Mediterranean (0.32). The significant difference between North and South regions is also validated by comparing the total mean scores of all South and North regions included in the study. Concerning membership, Northern regions have an average score of 1.59 whereas Southern areas present a mean score of 0.63. A similar difference is observed on volunteerism (Northern regions: 0.21, Southern regions: 0.12).

#### *Interest in politics*

Regarding the level of interest in politics, the least concerned citizens are those in Greece, Spain and Italy. In particular, respondents were asked to state their level of interest in politics on a 4 point Likert scale with lower scores indicating higher levels of interest. According to the results of the analysis, the least interested citizens are the ones of Sardegna (3.45) followed by resident of the Ionian (3.44) and Illes Balears (3.21). The most interested citizens are those of Scotland (2.60) and Southern Finland and Åland (2.61). The higher level of interest in the Northern regions is also highlighted by comparing means of all South (2.85) and North regions (2.61).

#### *Level of satisfaction with public issues*

The level of satisfaction was measured for several public issues including the national government, democracy, health services, the economy and education, all included in one factor. The results indicate that the most satisfied citizens are those in Bornholms Amt and Southern Finland and Åland where mean scores of 0.48 and 0.44 were recorded respectively. It is also interesting to observe that Cyprus is ranked third among all regions of the survey (0.30).

Significantly lower scores are obtained for North Aegean (-1.26), Ionian Islands (-0.96) and Sardegna (-0.87). The significant disparity between the level of satisfaction among Southern and Northern regions is also highlighted when comparing mean scores of the two large groups (North and South regions). The average mean score of the Northern areas is 0.25 whereas the mean score for the Southern regions is -0.20.

**Nordic islands present higher scores in social capital than the southern ones:** higher levels of social trust and civic participation indicate more “connected” areas, therefore more enhanced productivity and level of cohesion.

### **3.2.2.11. Governance Quality**

Governance quality refers to the effectiveness of local authorities and the procedures used in order to involve the participation of stakeholders in planning and decision making processes- these parameters make an area more attractive than another.

A survey reveals that there are different national traditions of governance across European space and that these differences still influence practices (ESPON Atlas, 2006, p.60). A categorisation of countries in terms of their “shift towards governance” shows that countries such as France, Spain, UK, Sweden, Denmark and Finland are leaders at this process. On the other hand in Malta, Cyprus, Esthonia and particularly in Greece, traditional patterns of government are still dominant.

The intensity of interregional co-operation is another indirect sign of changes in government mentality; Baltic Sea regions (even Polish regions) seem to be the most active ones through the B7 network. Highlands and Islands, Kriti, Corse and Illes Balears are also active and so are North Italy, South France, coastal regions of Spain and Portugal.

Such experiences as the ones of the B7 network are rarer in the Mediterranean islands even if Illes Balears, Sicilia and Sardegna are autonomous regions. Individual efforts for introducing participative governance procedures exist in some localities, such as the island of Lipsi with impressive results (as the analysis of the questionnaires of attractiveness indicate) but is not a general trend.

From previous ESPON study (ESPON 2006f, Governance of Territorial and Urban Policies from EU to local level and ESPON Data Base), there is a valuation of countries and NUTS 2 regions governance performance. Even if the valuation system is different

between countries and regions, it is clear Nordic countries and regions plus Spain have better performances than European average; specifically at the regional level in a scale between 1 (better performance) and 4 (worst performance), Åland, Balearics and Cyprus are graded with 1, Corse with 2, Malta with 3, when the Greek and the Italian islands are graded with 4.

**This parameter can explain some differences of the state of the islands, as governance quality influences public policy and is linked to effective development.**

### **3.2.2.12. Employment opportunities**

The particular indicator can be approached indirectly by the percentage of the economically active population, the evolution of the employed and unemployment (total, women, young) that were presented earlier in this report (section 3.1).

### *3.2.3. Classification of Attractiveness factors by islanders*

**The perception that islanders have about the importance of the attractiveness parameters is very important as it can influence (among other issues) policy priorities.** It has to be underlined here that “scientific objectivity” is necessary but not critical to persuade businessmen and population about islands’ attractiveness and to influence their decision for location. So, the classification of attractiveness parameters by importance from the islanders is very useful information. The entire methodological approach is given in Annex I and the analysis of the information collected by questionnaires in the Annex IV.

#### **3.2.3.1. Islands’ attractiveness for living (Local Authorities’ Responses)**

In the field research, 75 local authorities from various EU insular areas participated (municipalities, prefectures, provinces) in order to provide insights on the most important factors that affect the attractiveness of an island for residence. The respondents were asked to rate twenty four different factors that could define islands’ attractiveness for permanent residence on a scale from 1 to 5 (1 was the first most important factor of attractiveness, 2 the second most important factor and so on).

#### Classification of Factors

In Table 7 the hierarchy of attractiveness factors based on their importance is presented. Values closer to 1 denote higher importance while those closer to 5 signify lower importance and –

according to the respondents- have little influence on someone's decision to live on an island. Factors not rated by the respondents are excluded. The classification of the parameters is performed in four classes according to the frequency of the values (Table 7):

- High priority factors, with importance level up to 3.5 that are considered to be those with direct influence in residence decisions.
- Intermediate priority factors, with importance level from 3.51 to 4.00 that include factors conceived as important.
- Low priority factors, with importance level from 4.01 to 4.85 that include factors which affect decisions indirectly.
- Insignificant factors with importance level from 4.86 to 5.00 that concerns factors that have very little or no importance.

The five most important factors are (Table S3.2.6):

1. **Quality of health care system**, in which health infrastructure (hospitals, clinics etc), equipment and sufficient qualified personnel (doctors of major specialties and nurseries) are included. Deficiencies of health care lower the quality of life on islands and increase the inequalities between islands and the european mainland. The opposite is also true for islanders, as low quality of health system is a preventing factor, since the confrontation of an emergency incident usually involves transfer to another island or to the european mainland.
2. **Trip frequency**, which involves accessibility of the island and regularity of scheduled trips.
3. **Regularity of water supply**, mentioned by many respondents, especially from southern countries, where this problem is acute.
4. **Job Opportunities** that increase the feeling of security and well-being. This is especially important for the younger part of the population, as the opposite –non availability of jobs- is a major reason for abandoning the island.
5. **Quality of life** that can be considered to include all the above factors among others.

Table S3.2.6: Classification of factors influencing the attractiveness of islands for living according to their average score

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**High priority factors (1.00-3.50)**

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Quality of health care system  
 Trip frequency  
 Regularity water supply  
 Job Opportunities

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**Medial priority factors (3.51-4.00)**

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Quality of life

Quality of education services.  
Regularity of energy supply

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**Low priority factors (4.01-4.85)**

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Cost of travel  
Cost of living  
Quality of nature  
Quality of transport  
Career opportunities  
Land of cost  
Connection to the water waste system

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**Insignificant- complementary factors (4.86-5.00)**

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Effectiveness of solid waste collection  
Linguistic, religious, racial or ethnic diversity in society  
Opportunities to attend cultural events  
Quality of public transport system  
Quality of built environment  
Networks of trust and social capital  
Training opportunities  
Participation in non-government collective activities

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### **3.2.3.2. Islands' attractiveness for economic activities (Chambers and Local Authorities Responses)**

The second type of questionnaire was addressed to chambers and local authorities (municipalities, prefectures, universities) in order to investigate and define the factors that make an island attractive for setting up local economic activities. In total 55 responses were gathered, 40 of which were valid. Participants were asked: a) to prioritize the five most important factors from a list of 24 and b) to rate all factors on a scale from "very important" to "insignificant". As before, values closer to 1 indicate the most important factors and those closer to 5 are the least important ones.

Table S3.2.7: Classification of factors influencing islands attractiveness for business according to their average score

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**High priority factors (1.00-3.50)**

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Trip frequency  
Economic incentives  
Regularity of water supply  
Development vision of local authorities  
Regularity of energy supply  
Travel cost

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**Medial priority factors (3.51-4.00)**

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Effectiveness of public administration  
Labour costs  
Land and construction cost  
Quality of transport services  
Supply of trained/ qualified human capital  
Competence of local authorities to solve problem

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**Low priority factors (4.01-4.3)**

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Quality of local public transport  
Broadband connection  
Possibility to support innovation  
Degree of stakeholder involvement in decision making  
Support by other business  
Business support agencies

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**Insignificant- complementary factors (4.31-4.40)**

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Security  
Effectiveness of solid waste collection  
Connection to the waste water system  
Cooperation with other business  
Threat of natural hazards  
Threat of technological hazards.

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The first six factors are (Table S3.2.7):

1. The **Frequency of scheduled trips** is the most important factor for the majority of the participants for business attractiveness on an island. This could be justified as islands are highly dependent from mainland suppliers.
2. **Economic Incentives** that rate the provision of economic motives that target to balance the disadvantages of islands and vary from subsidization of initial development to subsidization of operating costs among others.
3. **Regularity of water supply** was considered an important factor, since hotels and tourism businesses are important activities on islands and require constant water supply.
4. **The vision of local authorities** is considered by islanders to be of great importance if local authorities recognize the distinctiveness of the island and have a concrete plan for its development.
5. **Regularity of energy supply** is the fifth most important factor as problematic energy supply implies cost for businesses.
6. **Travel cost** is another factor that influences business decisions, since it affects the cost of products.

**Common factors**

From the listed factors, ten are common (table S3.2.8). In most of them, the hierarchy ranking has small differences.

Table S3.2.8: Commons Factors of the attractiveness of islands for living and business ranked in decreasing priority

Factor	Business hierarchy	Population hierarchy
Trip frequency	1	2
Regularity of water supply	3	3
Regularity of energy supply	5	7
Travel cost	6	8

Land cost	9	13
Quality of transport services	10	11
Broadband connection	14	-
Effectiveness of solid waste collection	20	15
Connection to the waste water system	21	14
Quality of public transport system	13	18

Trip frequency ranks second (2) for living and first (1) for business attractiveness. Regularity of water supply, travel cost and quality of transport services have similar hierarchy rankings in both cases. Land cost is prioritized higher for business than for residence, while effectiveness of solid waste collection is ranked higher for residence compared to business attractiveness. Broadband connection is ranked 14<sup>th</sup> in the business hierarchy and was not selected at all for residence.

### 3.2.4. The results of the Delphi workshop

The Delhi workshop included two different rounds for factors of attractiveness for both residence and economic activities.

#### a) Factors of residence attractiveness

According to the results of the first round the participants classified the attractiveness factors in descending order: The most important factor is **Job opportunities** (average rate 6.6), followed by **quality of health** (6.33), **quality of life** (6.33), **Career opportunities** (6.2), **Quality of nature** (6.2), **Regularity of water supply** (6.067), **Frequency of scheduled trips** (5.933), **Regularity of energy supply** (5.867), **Quality of education services** (5.867), and **Training opportunities** (5.667). The rest factors received lower average rating. The three factors that received the lowest scores are: **Opportunities to attend cultural events** (4.067), **Opportunities to attend sports events** (3.6) and **Linguistic and Religious diversity** (3.333).

Comparisons with the answers of the chambers and local communities reveal that eight out of the ten first factors are common (Table S3.2.9).

Table S3.2.9: Comparison of factors' importance for residence between experts and local authorities

Factor of attractiveness (experts evaluation)	Factor of attractiveness (local authorities evaluation)
1. Job Opportunities	1. Quality of health care and services
2. Quality of health care and services	2. Frequency of scheduled trips
3. Quality of life	3. Regularity of water supply
4. Career Opportunities	4. Job opportunities
5. Quality of nature	5. Quality of life
6. Regularity of water supply	6. Quality of education services



7. Frequency of scheduled trips	7. Regularity of energy supply
8. Regularity of energy supply	8. Cost of travel
9. Quality of education services	9. Cost of living
10. Training opportunities	10. Quality of nature

### b) Factors of business attractiveness

The same procedure was followed for the investigation of the factors that the group of experts considers as the most important for the development of economic activities in insular areas. The first ten factors according to the evaluation of experts and the responses of the local chambers are presented in Table S3.2.10.

Six out of the first ten factors are the same for both groups. The factors that were further included from experts are: 1) the **supply of trained human capital**; 2) **Broadband connection**; 3) **Competence of local authorities**; and 4) **Support innovation**. From the side of local chambers the four different factors are: 1) **Economic incentives**; 2) **Cost of labor**; 3) **Land and construction cost**; and 4) **Quality of transport services**.

Table S3.2.10: Comparison of factors' importance for business between experts and local authorities

Factor of attractiveness (experts evaluation)	Factor of attractiveness (local chambers)
1. Frequency of scheduled trips	1. Frequency of scheduled trips
2. Regularity of energy supply	2. Economic incentives
3. Supply of trained human capital	3. Regularity of water supply
4. Regularity of water supply	4. Development vision of local authorities
5. Broadband connection	5. Regularity of energy supply
6. Effectiveness of public administration	6. Cost of air and sea travel to mainland
7. Competence of local authorities	7. Effectiveness of public administration
8. Development vision of local authorities	8. Labor cost
9. Cost of air and sea travel to mainland	9. Land and construction cost
10. Support innovation to production	10. Quality of transport services

The differences in the classification between local stakeholders and experts could be attributed to the more technocratic view of the experts that express the broader (global) view concerning attractiveness and the islands development perspective based on parameters such as the human capital, ICT, innovation. The locals have a less broad view since they focus on the everyday problems and can see the solutions to the "classical" hard infrastructure and activities.

The second round of the evaluation between experts produced little differences in both of the two categories (Table S3.2.11).

Table S3.2.11: Factors of attractiveness at the 2<sup>nd</sup> round of Delphi

Factor of attractiveness for business	Average	Factor of attractiveness for living	Average
Regularity of energy supply	5.765	Job Opportunities	6.00
Frequency of scheduled trips	5.706	Quality of life	5.824
Supply of trained human capital	5.294	Frequency of scheduled trips	5.412
Effectiveness of public administration	5.176	Quality of nature	5.353
Broadband connection	5.176	Quality of health care and services	4.882
Competence of local authorities to solve problems	5.176	Regularity of water supply	4.824
Regularity of water supply	4.824	Career opportunities	4.353

From the classification of attractiveness parameters, some remarks can be made:

- **both stakeholders and experts give importance to the main parameters of attractiveness influenced negatively by insularity: accessibility and services of public interest (energy, water, healthcare, education)**
- **preservation of quality of life and quality of nature are seen as an asset by both the stakeholders and the experts**
- **governance is considered as an important factor influencing local development**
- **economic incentives are important for local entrepreneurs**
- **development strategy is perceived differently by locals (mass tourism and construction, traditional agriculture based on low skilled labour force) and experts (high added value products and services, with skilled labour force using new technologies).**

The results of the above analysis are going to be used in order to:

- a) Choose parameters for attractiveness index,
- b) Elaborate the SWOT analysis and
- c) Prioritize policy actions.

### 3.2.5. Attractiveness indexes

After the presentation of the available data for the variables proposed in the methodology and the classification of the attractiveness parameters from stakeholders and experts, three indexes for the attractiveness of islands are proposed:

- (a) A first based on issues influenced directly by insularity (***Attractiveness Direct***);
- (b) A second based on issues that are indirectly influenced by insularity (***Attractiveness Indirect***)

(c) A third based on the natural and cultural assets of the islands (**Attractiveness Assets**) as an indication for quality of life and a potential for development.

The construction of the indexes is based on:

- the scientific approach developed above;
- the classification of attractiveness parameters from stakeholders and experts;
- the availability of data allowing comparisons.

For the construction of the **Attractiveness Direct Index** is used:

- (a) for accessibility, the ESPON's Multimodal Accessibility Index as it is the only one covering whole Europe at NUTS 3 level,
- (b) for urban dynamism the Functional Urban Areas (FUA) concept was used, where data are available only at NUTS 3 level,

Table S3.2.12: Indicators, classes and calculation of the Attractiveness Direct Index

Geo name	Agglomeration Economies (FUA)	FUAave classes	multimodal Accessibility	Access multimodal classes	Attractiveness Direct
CY Cyprus	1,75	4	51	2	3
DK014 Bornholm	1	2	94	4	3
ES53 Illes Balears	*		99	5	2,5
ES532 Mallorca	2,9	6	**	5	5,5
ES533 Menorca	1,7	4	**	5	4,5
FI20 Åland	1,4	3	76	3	3
FR83 Corse	1,35	3	76	3	3
GR221 Zakyntos	No FUA	0	70	3	1,5
GR222 Kerkyra	1,1	3	80	4	3,5
GR223 Kefallinia	No FUA	0	48	2	1
GR224 Lefkada	No FUA	0	58	2	1
GR411 Lesvos	1,1	3	72	3	3
GR412 Samos	No FUA	0	68	3	1,5
GR413 Chios	0,9	2	65	3	2,5
GR421 Dodekanisos	2	4	79	3	3,5
GR422 Kyklades	1,1	3	67	3	3
GR43 Kriti	1,6	3	61	3	3
ITG1 Sicilia	0,9	2	65	3	2,5
ITG2 Sardegna	1	2	65	3	2,5
MT001 Malta	2,9	6	83	4	5
MT002 Gozo and Comino	No FUA	0	71	3	1,5
SE214 Gotlands län	1,4	3	70	3	3
UKJ34 Isle of Wight	No FUA	0	96	4	2
UKM64 Western Isles	No FUA	0	24	1	0,5
UKM65 Orkney Islands	No FUA	0	29	1	0,5
UKM66 Shetland Islands	No FUA	0	24	1	0,5

\* Calculation of "regional" FUA is irrelevant when the cities are on different islands

\*\* As Accessibility has been estimated only for Illes Balears, the same value is used for both Mallorca and Menorca

A European average is not available and the classes used for the calculation of the index had to be estimated with the normalisation method using the maximum and the minimum values from all the European regions (ESPON Database). This index is calculated only for NUTS 3 level (as accessibility and urban dynamism on the national and the European level are irrelevant). As already explained above, islands **score particularly low for both these variables (the median value is 3 with the EU27 average at 5)** except only two islands overpass the average of European NUTS3: Malta and Mallorca (Graph S3.2.2A).

The **Attractiveness Indirect Index** is calculated with the use of the following indicators:

- (a) The percentage of population with low education level of the total population in 2007 for labour qualification;
- (b) The Research and Development expenditure as percentage of the GDP (2008);
- (c) The percentage of households with broadband access % of the total number of households for ICT involvement;
- (d) The unemployment % of young people (15-24 years old) for jobs opportunities;
- (e) The Governance indicator (qualitative approach from ESPON 2006 f)

The inclusion of more variables, such as one or two related to Public Interest Services is meaningless at NUTS 2/3 levels as the problem of availability or not (and the quality of services) is raised at the island level. The same unavailability of data excludes the "Safety" parameter. "Natural and Technical Hazards" is not considered by the stakeholders as an important parameter, so it was decided to not use it. Natural and Cultural assets are considered separately, as they concern a potential that may be developed or not.

The above variables are considered as key ones in the Lisbon Strategy as they are driving forces for a competitive economy in a long term perspective. **The results for islands are particularly alarming with all island regions situated at a significant distance from the European and the member states average** (Graph 7B). It has to be underlined that all the islands are below the EU average for the Indirect Attractiveness Index and only Illes Balears (Mallorca only) has a score above the EU average for the direct Attractiveness Index.

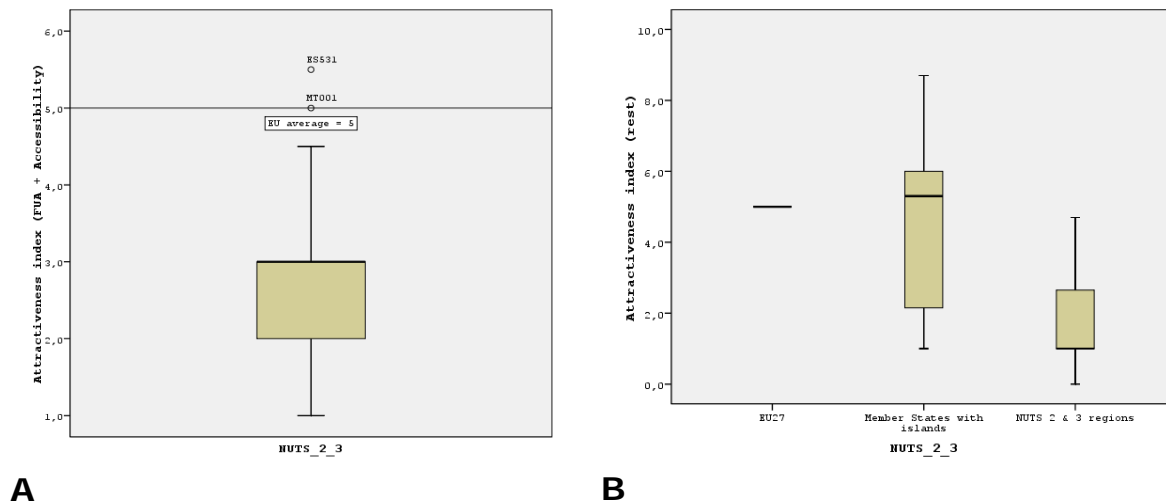
Table S3.2.13: Indicators, classes and calculation of the Indirect Attractiveness Index

Geo name	low educational level	low educational level (EU27 =100)	low educational level inverse classes	R&D expenditure %GDP 2008 (NUTS 2 different years)	R&D expenditure %GDP 2008 (EU27 =100) (NUTS 2 different years)	R&D expenditure %GDP 2008 classes (NUTS 2 different years) classes	Households with broadband access % 2008	Households with broadband access % 2008 (EU=100)	Households with broadband access % 2008 (EU=100) classes
CY Cyprus	32,6	112,0	4	0,46	24,2	1	33	67,3	2
DK Denmark	17,3	59,5	9	2,72	143,2	9	74	151,0	9
EE Estonia	10,9	37,5	9	1,29	67,9	2	54	110,2	6
ES Spain	51,2	175,9	1	1,35	71,1	2	45	91,8	4
ES53 Illes Balears	55,6	191,1	4	0,33	17,4	1	50	102,0	5
FI Finland	21,2	72,9	8	3,73	196,3	9	66	134,7	8
FI20 Åland	29,5	101,4	5	0,16	8,4	1	64	130,6	8
FR France	33,6	115,5	3	2,2	115,8	7	57	116,3	7
FR83 Corse	64,2	220,6	1	0,22	11,6	1	57	116,3	7
GR Greece	40	137,5	1	0,58	30,5	1	22	44,9	1
GR22 Ionia Nisia	57,2	196,6	1	0,16	8,4	1	18	36,7	1
GR41 Voreio Aigaio	47,7	163,9	1	0,48	25,3	1	18	36,7	1
GR42 Notio Aigaio	48,1	165,3	1	0,15	7,9	1	18	36,7	1
GR43 Kriti	44,6	153,3	1				18	36,7	1
IT Italy	49,3	169,4	1	1,18	62,1	1	31	63,3	1
ITG1 Sicilia	56,7	194,8	1	0,8	42,1	1	22	44,9	1
ITG2 Sardegna	58,9	202,4	1	0,58	30,5	1	27	55,1	1
MT Malta	74,7	256,7	1	0,54	28,4	1	55	112,2	6
SE Sweden	16,5	56,7	8	3,75	197,4	9	71	144,9	9
UK United Kingdom	14,8	50,9	9	1,88	98,9	5	62	126,5	8
EU (27 countries)	29,1	100,0	5	1,9	100,0	5	49	100	5

Table S3.2.13 (continued): Indicators, classes and calculation of the Indirect Attractiveness Index

Geo name	Unemployment rate total 15-24 2008	Unemployment rate total 15-24 2008 (EU27 =100)	Unemployment rate total 15-24 2008 (EU27 =100) inverse classes	Governance	Attractiveness Indirect
CY Cyprus	9	57,7	9	6	4,4
DK Denmark	7,6	48,7	9		9,0
EE Estonia	12	76,9	7		6,0
ES Spain	24,6	157,7	1		2,0
ES53 Illes Balears	24,3	155,8	1	8	3,8
FI Finland	16,5	105,8	4		7,3
FI20 Åland	10,6	67,9	8	8	6,0
FR France	19	121,8	3		5,0
FR83 Corse	18	115,4	3	5	3,4
GR Greece	22,1	141,7	1		1,0
GR22 Ionia Nisia	26,7	171,2	1	4	1,6
GR41 Voreio Aigaio	20,2	129,5	2	4	1,8
GR42 Notio Aigaio	14,9	95,5	5	4	2,4
GR43 Kriti	13,9	89,1	6	3	2,2
IT Italy	21,3	136,5	1		
ITG1 Sicilia	39,3	251,9	1	2	1,2
ITG2 Sardegna	36,8	235,9	1	2	1,2
MT Malta	12,2	78,2	7	4	3,8
SE Sweden	20,2	129,5	2		7,0
UK United Kingdom	15	96,2	5		6,8
European Union (27 countries)	15,6	100,0	5		5,0

Graph S3.2.2: Box-plots of the Direct and Indirect Attractiveness indexes for islands NUTS 3 island regions (A) and for national values and NUTS 2- 3 island regions (B)



The **Attractiveness Assets Index** is calculated with the use of the following indicators:

- (a) for natural assets, the percentage of NATURA 2000 area is used;
- (b) for cultural assets, the concentration of monuments in an area is estimate.

As it has already mentioned is the only index for which a lot of islands, mainly of the Mediterranean, have a score above the average of EU regions.

Finally, a high positive correlation (Table S2.15 – Graphs S3.2.3) is detected between a composite direct and indirect attractiveness index and the state of the islands only for the 11 NUTS 0/2 island regions; the correlation is very high when the State Index 4 (without the environmental parameter) is correlated to the composite attractiveness index. In order to be confident that there is a causal link between attractiveness and state further statistical analysis with more data (mainly more areas) is necessary.

Table S3.2.14: Indicators, classes and calculation of the Attractiveness Assets Index

Geo name	Land under NATURA 2000 (km2)	Land under NATURA 2000 % of total	Land under NATURA 2000 % of total (EU27=100)	Land under NATURA 2000 % of total (EU27=100) classes	Density of monuments	Cultural indicator	Assets indicator
CY Cyprus <sup>35</sup>				9	0,0023	1	4,5
DK Denmark	423639	9,9	69,7	2			
DK014 Bornholm	8034	13,5	95,1	5	0,2396	4	4,5
EE Estonia	794721	18,3	128,8	8			
ES Spain	13880379	27,4	193,2	9			
ES53 Illes Balears	111051	21,8	153,5	9	0,5668	5	7
ES531 Eivissa y Formentera							
ES532 Mallorca							
ES533 Menorca							
FI Finland	4959995	14,7	103,5	5			
FI20 Åland	2942	1,9	13,4	1	0,0026	1	1
FR France	4972249	9,1	63,8	1			
FR83 Corse	114727	13,2	92,7	4	0,0306	2	3
GR Greece	2595058	19,8	139,1	9			
GR221 Zakynthos	5176	12,7	89,4	4	2,3124	8	6
GR222 Kerkyra	5875	9,6	67,6	2	4,3881	9	5,5
GR223 Kefallinia	9477	10,5	73,9	2	2,0741	7	4,5
GR224 Lefkada	5434	13,6	95,8	5	0,0000	1	3
GR411 Lesvos	45372	21,5	151,4	9	1,3064	6	7,5
GR412 Samos	27446	27	190,1	9	2,4110	8	8,5
GR413 Chios	32265	35,1	247,2	9	2,0745	7	8
GR421 Dodekanisos	92107	28,9	203,5	9	3,1097	9	9
GR422 Kyklades	70878	21,6	152,1	9	5,4702	9	9
GR43 Kriti	272314	32,8	230,8	9	1,6877	8	8,5
IT Italy	5064396	16,8	118,4	7			
ITG1 Sicilia	407861	15,9	111,7	6	1,3136	8	7
ITG2 Sardegna	385255	20,0	141,1	9	0,5840	7	8
MT Malta	5066	14,5	102,1	5			
MT001 Malta	4086	14,9	104,9	5	0,0400	2	3,5
MT002 Gozo and Comino	980	13,2	93,0	4	0,0403	2	3
SE Sweden	7670683	17,1	120,2	7			
SE214 Gotlands län	16020	4,8	33,8	1	1,1947	6	3,5
UK United Kingdom	1880238	7,7	54,2	1			
UKJ34 Isle of Wight	3344	6,5	45,8	1	0,3013	5	3
UKM64 Western Isles	99765	18,3	128,9	8	0,0670	2	5
UKM65 Orkney Islands	21849	12,1	85,2	4	0,3681	5	4,5
UKM66 Shetland Islands	22651	8,5	59,9	1	0,2531	4	2,5
European Union (27 countries)	61090938	14,2	100,0	5			

<sup>35</sup> The stakeholder of Cyprus has provided national information (see the case study of Cyprus) on NATURA 2000 Areas and cultural monuments that differ significantly from the information available in the ESPON DataBase. More specifically, Cyprus has extended the NATURA 2000 from a total cover of 14% in 2005 to 26,8% for 2010. Therefore, the value of the correspondent indicator has to be changed into 9. Concerning the Density of Monuments, the additional information provided affirms that the indicator estimated by the corresponding ESPON study underestimates the actual figure. Nevertheless, it is impossible for the TPG to provide another quantitative estimation for this indicator. A re-evaluation of the Assets' indicator for Cyprus to a value equal with that of the Greek islands (8,5) could be applied as Cyprus shares a common historical past with these islands.

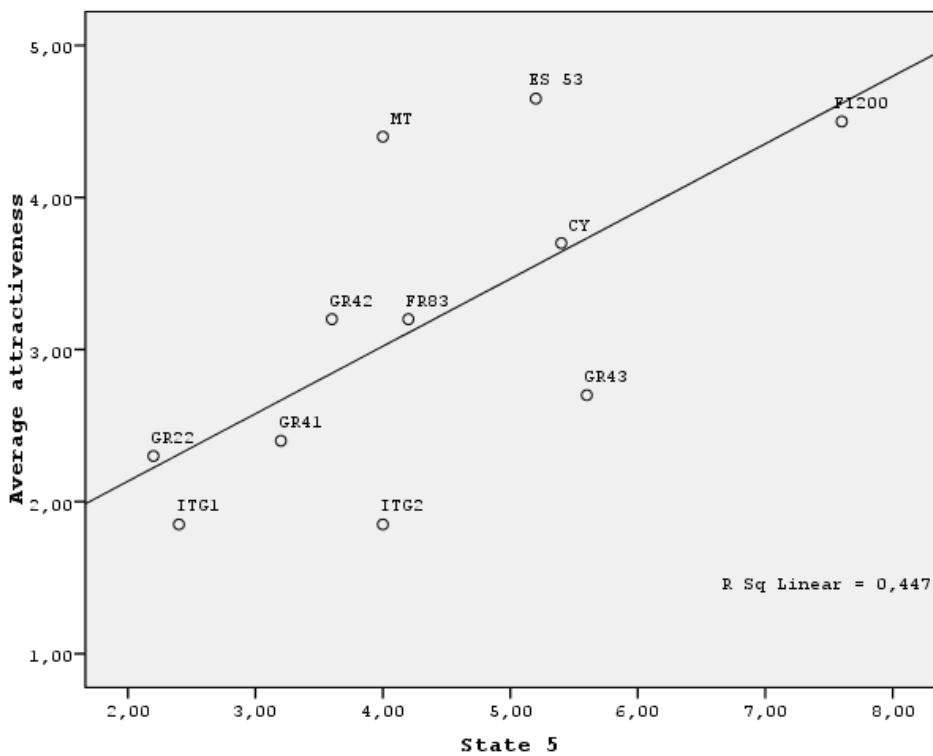
Table S2.15 Correlations between State and Attractiveness

		Average attractiveness	State 4	State 5
Average attractiveness	Pearson Correlation	1	,819(**)	,668(*)
	Sig. (2-tailed)		,002	,025
	N	11	11	11
State 4	Pearson Correlation	,819(**)	1	,858(**)
	Sig. (2-tailed)	,002		,001
	N	11	11	11
State 5	Pearson Correlation	,668(*)	,858(**)	1
	Sig. (2-tailed)	,025	,001	
	N	11	11	11

\*\* Correlation is significant at the 0.01 level (2-tailed).

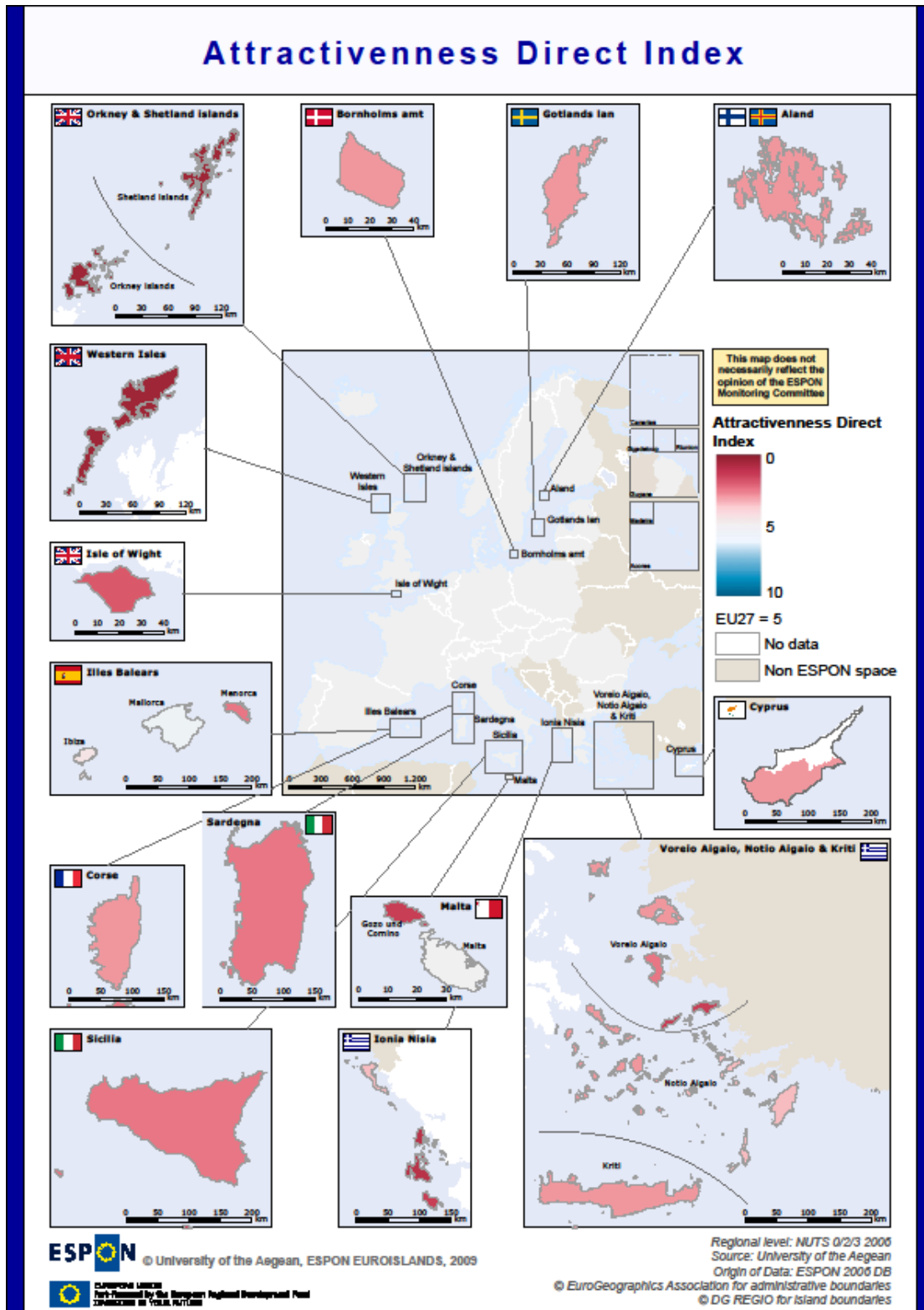
\* Correlation is significant at the 0.05 level (2-tailed).

Graphs S3.2.3. Correlations between State and Attractiveness

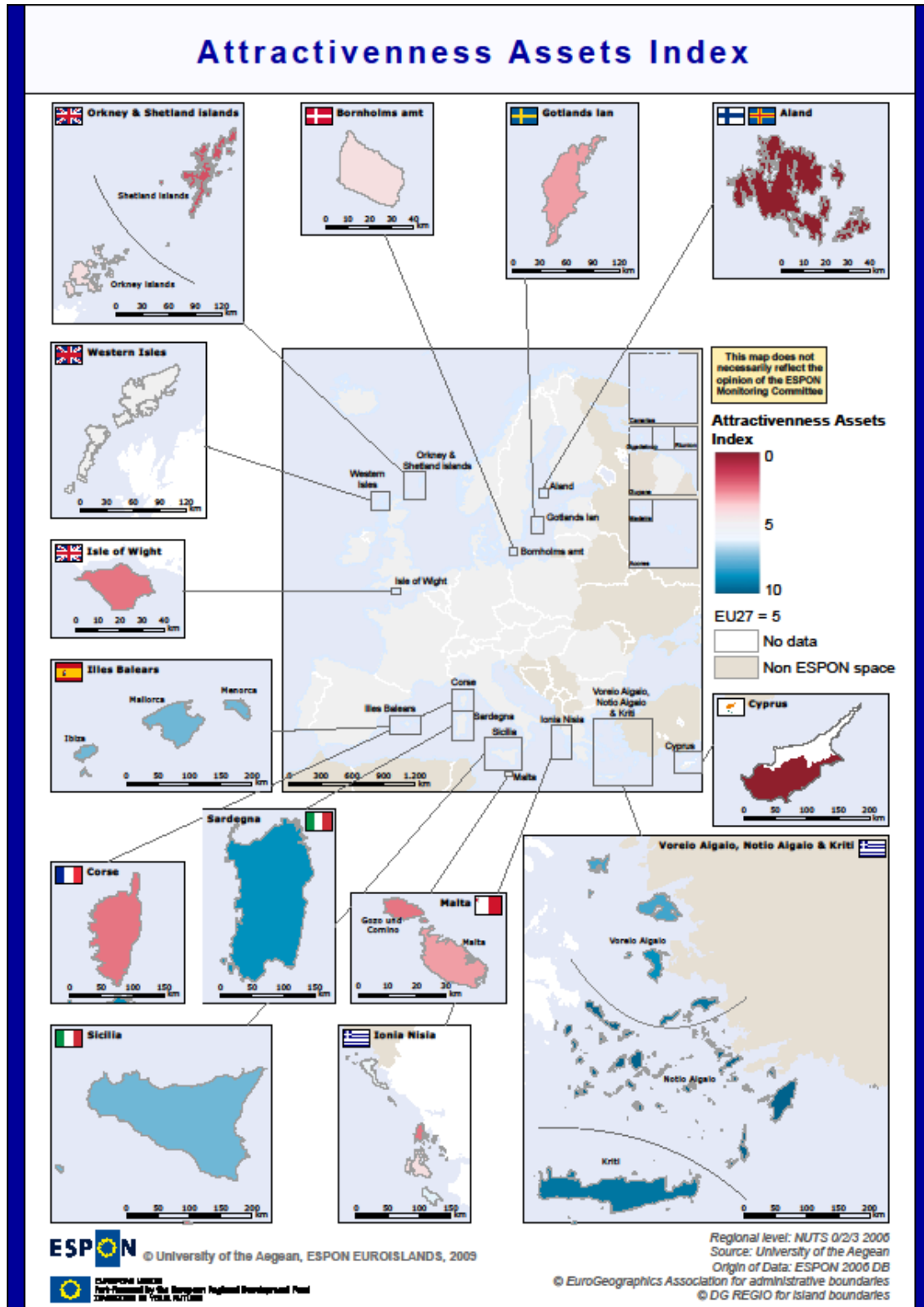




Map S17: Attractiveness Direct Index for Island-states, NUTS 2 and NUTS 3 islands concerning accessibility and urban dynamism



Map S18: Attractiveness Assets Index for Island-states, NUTS 2 and NUTS 3 islands concerning Educational level, R&D, broadband access and use of Internet



### ***3.3. SWOT analysis and presentation of islands' potential***

#### ***3.3.1. Introduction***

From the previous analysis some points of importance stem:

- **The performance of the islands is generally lagging behind EU-27** for most of the key development indicators as State Index confirms. This low performance *has to be attributed to the low attractiveness of the islands as mentioned in the previous section*;
- **Vulnerability** is a characteristic feature of islands' economy (monoactivity or economy based on the state's presence) and environment (as intense economic activity mainly based on natural resources threatens the balance of these fragile ecosystems).
- **The attractiveness of islands is particularly low compared to national and to EU-27 average**; this affirmation stands for all the attractiveness parameters, influenced directly or indirectly by insularity, as well as for all the islands; low accessibility, low presence of Public Interest Services, low penetration of ICT, low labor qualification, low R&D and innovation are characterising the islands and they are undermining their future.
- On **small islands and archipelagos** attractiveness and performance are **even lower**;
- **Natural and cultural assets** constitute a promising potential for a significant number of islands.

The above analysis is confirmed by the stakeholders of "performing economies" as Illes Balears and Notio Aigaio; they don't consider any more their cases as "best practices" as their tourism development is under pressure from low cost destinations, climate changes and resources' shortage; at the same time they insist that the low performance in several attractiveness indicators (research and innovation, labor qualification, travel cost, double insularity in archipelagos etc) –due in a big part to their overspecialisation in the low added value activities of tourism and construction- create a lot of uncertainties about their future.

The fact is that the comparative advantage that these island regions had during the post world war period on mass 3S tourism has been sapped as new competitive (low cost) and "exotic" destinations have been developed worldwide since; during the same period these islands regions didn't managed to renew or to differentiate their tourism product. The decrease of their GDP per capita during the period 2000-6 is not a fortuitous fact.

At the same time stakeholders from the Nordic islands as Gotland consider the local dependency on national funds as “contradictory falouts”. This transfer of public fund has mitigates their decline but it was “not sufficient to turn island economies in a better position”. They believe that “investments are often a more proper term to address local (regional) needs to adopt structural changes”<sup>36</sup>.

Therefore, insularity has to be considered today as a **permanent, natural feature** that *affects negatively, directly and indirectly, islands’ attractiveness*. **Low attractiveness results subsequently to low performance in terms of sustainable development** and creates unequal opportunities between these territories and the rest of the European Union.

### *3.3.2. Revealing Islands’ Strengths and Opportunities.*

The Green Paper holds the respective subtitle “Turning territorial diversity into strength”. Apart from that, the Territorial Agenda of the EU (CEC, 2007) already underlined that diverse territorial potentials may form the basis for sustainable economic development. It states that “(...) *the diverse territorial potentials of regions for sustainable economic growth and job creation in the EU must be identified and mobilised. (...)*”

Development cannot be based only on existing activities and “recognised” resources. Development process is a dynamic one, revealing “new” resources, tangibles or intangibles that the local system has to identify and capitalize on them. **The challenge for islands is to exploit the constantly changing global environment, and make use of the characteristics of insularity as advantages rather than disadvantages.**

What could be an islands’ strategy during the second decade of the 21st century based on the characteristics of insularity, the strengths and the limitations of islands but also the opportunities coming out from the european and international environment? SWOT (Strengths, Weaknesses, Opportunities, and Threats) Analysis is an adapted tool for responding to this type of questions as well as a necessary step for approaching the 3<sup>rd</sup> question of this study: **“What policies would be appropriate for increasing the attractiveness of islands and ensure that their development meets the tenets of sustainable development”.**

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<sup>36</sup> Comments of stakeholders to the Draft Final Report

Based on the previous analysis of attractiveness (both the evaluation of the parameters and their classification by the stakeholders), the strengths, the weaknesses, the opportunities and the threats of the islands can be described as follows:

Concerning the **Strengths** of the islands, the main comparative advantages are the quality of life and their natural and cultural assets.

The Quality of Life (low stress life in a small scale society, quality landscape, proximity to nature, low human pressure on the environment compared to urban areas, etc.) is one advantage that has not only to be preserved<sup>37</sup> but also to be valorised by creating new job opportunities and a differentiated attractiveness from those of urban areas or other territories in general. As it is already presented, a high density of natural and cultural capital and a strong cultural identity is combined with the fact that islands have low nature fragmentation by artificial surfaces. This advantage is not particularly valorised to develop new jobs (cultural professions, environmental management) or to “renovate” traditional ones by producing for example quality food products; unlike these irreplaceable and non-renewable assets have been consumed by a low added value tourism. The past advantage of the islands as nodes of the global maritime network can be exploited again within a different development pattern based on liveability (ESPON 2006e, Synthesis Report III).

Concerning **Weaknesses**, insularity affects directly and permanently some of the most important attractiveness parameters<sup>38</sup>: accessibility, public interest services, private services and networks, economies of scale, small market, labor qualification, ICT penetration, etc. All the above parameters increase investments and operational costs for companies, households and local authorities. These disadvantages have to be attenuated by specific policies; focused policies are also needed to increase the low educational level of the labour force, information technology penetration, innovation and entrepreneurship etc fact accumulating weaknesses. At the same time it has to be clear that islands’ products and services cannot be competitive in the European and the global market through competitive (low) prices since low production cost on them is unattainable no matter what policy can be applied. .

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<sup>37</sup> Local stakeholders have also recognised “quality of life” as important attractiveness factor (see analysis above).

<sup>38</sup> The score of the Direct and Indirect Attractiveness Indexes for islands compared to those of European mainland is eloquent

The **Opportunities and Threats** parameters listed in the Table S3.3.1 are quite common issues for all the islands independently of their size, location and development level. Opportunities have to be seized as now the need *"involves upgrading the business environment through 'soft infrastructure'. Less tangible assets need to be cultivated, that enhance territorial capital and enable a region to realise its own potential. The exact formula will depend on the particular region"* (ESPON 2006, p.79).

More explicitly the islands have to exploit:

- New technologies in the fields of communication and information diminish the negative impact of insularity (small scale and isolation). New technologies can also be beneficial for small and medium sized companies and services such as education and research, health care services, information, cultural and other creative activities and so on.
- Other technological changes (development of new forms of renewable energy, technologies of partial substitution of natural resources, progress in the transportation field, etc.) can have a moderating effect on the limitations caused by insularity.
- The shift of human aspirations towards quality as it is expressed by an increasing demand from different population groups (as researchers, high position entrepreneurs, artists, individuals of economic potential etc) to settle in areas with high quality natural and man-made environments; in this case the provision of a broad range of facilities (economic and social services as well as various amenities) appears to be a prerequisite.
- The increasing importance of free time activities. Again, islands that may offer plenty of opportunities for leisure-oriented activities can turn themselves into attractive locales.
- The green economy, with low resource input and waste output that is a global demand, fits with islands' low resource availability.

The **Threats** as climate change, globalization, energy prices' raise etc have a global importance but they will affect more heavily islands that are economically and environmentally more vulnerable than European mainland.

For instance as transport is already very expensive for islands compared to the European mainland, in the case of energy prices rise, transport costs in islands will rise in a disproportional way as already for the same distance prices are higher for islands than on mainland<sup>39</sup>.

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<sup>39</sup> "Increasing energy prices will have negative impacts on accessibility particularly in rural and more remote areas. Such regions already have to contend with relatively poor accessibility; higher transport costs will compound

This is also true with climate change: sea level rise threatens more islands with limited area and a high concentration of assets and physical capital within the endangered coastal zone than continental mainland; water availability is a crucial parameter as the diminution of precipitations in parallel with temperature raise could affect dramatically water's disponibility at least for the Mediterranean islands, but also as coastal acquifers are more exposed to impacts from climate change<sup>40</sup>; the temperature rise is threatening the tourism activity in the Mediterranean; the costal erosion provoked by an increased frequency of wave attack at the clift foot and more effvicient debris removal from foreshore but also by changes in temperature and rainfall during the year<sup>41</sup>

Fishing stocks are seriously threatened by the pressure from the fishing activity and by the pollution. In some of the seas surrounding Europe the human pressure it used to be too high so the fish population has collapsed (Baltic Sea); in other seas as i.e. the Mediterranean and particularly the Aegean Sea the stocks are overexploited and coastal fishing activity is becoming problematic for local populations. This evolution has particularly severe impacts on traditional small scale fishing activity in small islands where opportunities for other activities are quasi inexistent.

Finally the increasing globalisation puts "traditional competitive activities" as tourism, agriculture and fisheries in an additional competition with cost competitive countries; innovation is the only way to stay competitive.

The above analysis is schematically presented in the Table S3.3.1.

Table S3.3.1: SWOT analysis of European islands

<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>• Quality of life</li> <li>• Natural Assets</li> <li>• Cultural Assets</li> <li>• Feeling of security – safety (not on very big islands)</li> <li>• Strong cultural identity based on the differentiate "experimental identity" of each area.</li> </ul>	Isolation and low accessibility: <ul style="list-style-type: none"> <li>• Limited market size / Low urban dynamism</li> <li>• Monoculture / vulnerability of the economy</li> <li>• High cost for providing Public Interest Services</li> <li>• Low coverage of Public Interest Services in small islands</li> <li>• Lack of local qualified labour due to low opportunities for employment and educational attainment</li> </ul>

this problem. Thus disparities between areas with high and low accessibility might increase (ESPON, 2006, p.7)

<sup>40</sup> ESPON, 2010, New Evidence on Smart, Sustainable and Inclusive Territories,p. 88-89

<sup>41</sup> EURISLES 2002, Of the coast of Europe, CPMR edition, p.50

	<ul style="list-style-type: none"> <li>• Low level of innovation</li> <li>• Low use of ICT technologies</li> <li>• Low job and carrier opportunities</li> </ul>
<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Liveability – Quality of life</li> <li>• Sustainability – Environmental Management</li> <li>• Accruing demand for quality and secure food products</li> <li>• Accruing demand for specific interest tourism</li> <li>• Cultural and creative economy</li> <li>• Residential Economy</li> <li>• Renewable sources of energy</li> <li>• ICT technologies</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>• Climate change, Water scarcity, Costal erosion, Sea level raise</li> <li>• Economic crisis / diminution of public transfers</li> <li>• Globalization / growing competition for products and services incorporating low added value (low capital intensity and low skilled labour)</li> <li>• Energy price's raise</li> <li>• Extinction of fishing stock</li> </ul>

### 3.3.3. Using Islands' potential (strengths and opportunities) within the European perspective

The fact that islands have specific characteristics and permanent natural handicaps should not lead to the conclusion that **islands are handicapped territories** and require a social policy in order to survive; on the contrary this supports the view that **islands need the right strategy** in order to valorize these characteristics within the European and the global environment. The SWOT analysis has underlined the strengths of the islands and revealed the opportunities, the challenges that islands are facing within the European context.

The right use of this analysis in the Strategy EUROPE 2020 context developed by the EU can lead to the elaboration of an **Islands' 2020 Strategy** by adapting islands' specificities, potentials and needs to European guidelines. In Table S3.3.2 three islands' priorities are proposed in accordance with the European ones:

Table S3.3.2: Priorities of EUROPE and Islands 2020 Strategy

<b>EUROPE 2020 Strategy</b>	<b>Islands 2020 Strategy</b>
<b>1. Smart growth:</b> developing an economy based on knowledge and innovation	<b>1. Qualitative islands:</b> focusing on well branded qualitative, products and services using local resources destined to niche markets
<b>2. Sustainable growth:</b> promoting a more resource efficient, greener and more	<b>2. Green islands:</b> diminishing the use and growing the reuse of scarce resources as water, land,



competitive economy	energy in the production of goods and services
<b>3. Inclusive growth:</b> fostering a high-employment economy delivering social and territorial cohesion	<b>3. Equal Opportunities islands:</b> giving the same opportunities to insular companies and populations to perform as in European mainland

In more detail:

- Qualitative islands priority is linked with the fact that islands' enterprises cannot hope to be competitive in the European and the world market with a strategy of mass and low cost production due to insularity (small size, small market, low accessibility). On the contrary, there are many cases where islands' products based on local resources and know-how are competitive. This success can be extended to services' production such as tourism, instead of consuming the islands' limited resources for a mass activity. New knowledge, innovation and skilled human resources are prerequisite for the success of such a strategy.
- Green islands priority is linked with the limited natural resources of islands. Here, the goal is to reduce the use of resources such as water, land, energy and recycle the waste produced both by enterprises and the local population. The greening of the islands' economy is part of the quality strategy but it mentioned separately due to its great importance for islands.
- Equal opportunities islands priority is linked with the goal for equal access of all European citizens to Services of General (Economic) Interest (SGI) -which are a *sine qua non* condition for quality of life and competitive entrepreneurship- as initially expressed in the European Spatial Development Perspective (ESDP, 1999). The relevance of SGI for economic, social and territorial cohesion is underlined into the Lisbon Treaty (article 14 and protocol 26).

The proposed strategy for the islands is based on:

A) The analysis of the specific characteristics and potentials of islands to be valorized and the opportunities to be exploited (priorities 1&2), while addressing the weaknesses (priority 3) with an ultimate goal of improving the performance of islands' economy,

maximizing the benefits of their advantages and achieving sustainable development goals.

B) The fact that some successful actions in accordance with this strategy already exist on islands and could be considered as best practices or as potentially good practices since many projects are under implementation.

Below are some examples of **best practices**<sup>42</sup> classified by priority axes:

- **Quality Islands:** Several agricultural and manufactured products of islands have “resisted” the competition within the European and the global market despite their relatively high prices, based on their quality (of local inputs and traditional production methods) and/or their uniqueness, creating a brand name. This concerns many food and beverages products as drinks (wines, beer, ouzo, raki, liqueurs etc), different types of cheese, honey, olive oil, mastic, meat and different types of sausages, butter, potatoes, cakes etc. Many of these are regulated by the European quality system of Protected Destination of Origin (PDO), Protected Geographical Indication (PGI), Traditional Specialty Guaranteed Agricultural Products, and Special Poultry Farming etc giving to them an official quality labelization. It concerns also tissues and cloths, handcrafts and other manufactured products, that, with or frequently without official label, have created their brand name.

If the above success stories are based mainly on sectoral or business initiatives usually with the support of public authorities (national and local) in traditional sectors, there are cases where quality is the main goal of an integrated local initiative; “Bright Green Bornholm” is the continuation of a successful Leader+ project where quality and sustainability were associated and concerns different sectors as energy, tourism, cultural products and services, foodstuff, manufactured products. “A Flavor of the Archipelagos” in Åland Islands is a similar initiative financed by Interreg associating local entrepreneurs in order to ameliorate the satisfaction of the visitors. The “Archpedalo” project also in Åland Islands in order to attract more bikers from Finnish mainland to visit the area knowing that they spend enough money and are environmental friendly; the program give seminars to tourist entrepreneurs along the path, increase quality and service, find and develop suitable market channels. The “Aegean Cuisine” in Notio Aigaio is an initiative of the Regional Innovation Center (running under the control of the local

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<sup>42</sup> These “best practices” are not related to the existing situation of the islands but to the proposed new strategy. Information for these best practices comes mostly from the 3<sup>rd</sup> questionnaire completed by the local authorities (Annex II) and the case studies surveys but also from other sources such as EURISLES 2002. A thorough analysis of the responses of local authorities is given in Annex II.

Chambers of Commerce and Industry) to promote local production and know-how in order to differentiate and upgrade the tourism product. "Cretan Quality Agreement" in Kriti which the main goals are to promote Cretan Diet (and cretan food) and to improve the quality of the tourism product.

In Illes Balears about 15 business clusters have been set up in order to increase the productivity and the competitiveness of the local firms: the audiovisual cluster, the cluster of IT applied to the tourism sector, the nautical cluster, the Ibiza Music cluster etc.

"Master and Back" is a high level training program implemented and financed by the Region of Sardegna; it concerns young people which are selected to attend PhD and Master degree courses in Italy or abroad and then to work for two years in the public or the private sector in Sardegna. In Malta the Ministry for Gozo has financed additional cost of high level courses in Malta Gozo Center in order to facilitate local people to access at higher level of education.

- **Green Islands:** Different initiatives have been undertaken in islands in order to address either general environmental problems as climate change or specific problems related to insularity. Islands, as isolated systems with energy provision problems have attract the attention of European, national and local authorities but also of Researchers and Businesses for experimental applications on Renewable Energy Production; Kythnos Island (Kyklades) was used during the '80 for the installation of an hybrid integrated and autonomous system as well as of the first wind power-mills park in Greece. Samsø is a well known example for being an energy independent island based on wind, solar, biomass energy; most important is the direct involvement of islanders to the project who have invested within the system. In Eigg, a Scottish island of 80 inhabitants, they realized a dream to have energy during all day by using an autonomous system based on a combination of renewable energies. There are many other examples (Gotland, Bornholm, Canarias, etc) where islands were used as pioneers in renewable energy systems, a fact that has permitted to create economic activity, jobs and know-how into a modern sector. The Network "IsleNet", established during the '90s with the political support of CPMR's Island Commission to address energy problems of islands, has a consequent contribution to this progress; the implication of many mayors from islands to the Covenant of Mayors and the implementation of projects like "Pact of Islands" and "Green Island" by the DG Energy is some of the output of good networking and governance.

Some other success stories can also be underlined: On Milos Island (Kyklades) a 600kw wind mill is producing 2.600 m<sup>3</sup> of potable water daily covering local demand, substituting the transfer of water

by ship from the mainland. A similar project of an off-shore (floating) desalinization system using wind power realized in Greece from the University of the Aegean has received an EU award (RegioStars 2008). Mallorca's local authorities have developed an integrated system for treating all the solid waste produced on the island. Illes Balears have an extensive program for the management of natural and cultural resources: 7 natural and 1 national park, Minorca as Unesco's Biosphere Reserve, 113 areas within the Natura 2000 network, a monitoring system for *Posidonea oceanica* and an Integrated Coastal Zone Management system. Corse has established an Office for the Environment and has engaged in protection actions within the natural reserves and regional natural park. The Scottish Islands Federation is promoting the sustainable island based on an alternative way for food production. The Network of Small Greek Islands "Dafni" is working for the promotion of best practices on different topics of sustainability but also to support local authorities to implement innovative actions in their territory; this association runs also the "Aegean Energy Office" under EU finance. In Sardegna, the collaboration between the Regional Conservatory of the Coasts, the Municipality of Cabras, the Marine Protected Area of Cabras, the Association of Cabras' Fishermen has lead to the creation of a specific touristic product based on the valorization of a Natura 2000 area.

- **Equal Opportunities Islands:** the provision of equal opportunities to all the inhabitants of a country has been considered as matter of democracy in the Western world and national states took care of the provision of services of health, education and training, culture, transport, post, telecommunications, energy, etc.; these were provided generally within a monopoly status, covering the extra cost by the equalization of prices between islands and the mainland. Today most of these services are liberalized and market oriented and the competition principle has to be applied within the single European market rules. This application is not always without difficulties as the tiny insular market creates often a "de facto" monopoly situation. How, within this context, the public authorities are trying to satisfy the needs of islanders?

Concerning transport services there are different practices trying on the one hand to ensure the maximum of frequency and competition between different companies (in bigger islands) or at least a minimum service (in small islands, during the winter) and on the other hand to keep the cost of the travel as low as possible within the European legislation; the quality and the equity of the service between inhabitants of different islands are two additional conditions to be fulfilled. The Territorial Continuity Principle is applied in different ways in islands as Kokar (with 3 to 5

connections per day with Åland mainland), Samsø, Corse, Illes Balears, the Scottish or the Brittany islands by subsidizing part of the cost of the journey for the permanent inhabitants using private or public companies. In Åland the transport system between the islands of the Archipelago, that has its origins in the '50s, has 9 ferries capable for ice-braking assuring the same quality of transport to all the islands all over the year, free of charge for the residents financed (18MEUR in 2009) by the government.

In Greece, the state gives priority to assure the minimum service by subsidizing the ship companies' operational cost and not the cost of travel to islanders (100MEUR in 2009); but as the services obtained by the system are not considered as satisfactory by the users, local authorities as the Municipalities of Kalymnos and Tilos have decided to create municipal companies to bridge the gap. In air transport the connections considered as non profitable are also subsidized through pluri-annual contracts to keep schedules and prices low for all passengers in order to improve accessibility for smaller islands and to create inter-islands connections.

The development or the maintenance of other SGI on islands (i.e hospital services on Samsø) face similar problems as decreasing public budgets is a common goal in all member states; in Dodecanissos a "mobile health center" financed by the Prefecture has permitted to provide on a regular basis a wide range of health services to the inhabitants of small islands as Lipsi. On Illes Balears the creation of ParcBit, the technological park, serves as a platform to introduce and develop the information society within the Region. In the Papa Westray Island (archipelagos of Orkney) the six teenagers that reside on the island take the flight every Tuesday morning from their island, stay with host families for two nights and then they catch a return flight on Thursday after school; the above described service or the maintenance of high schools in small greek islands, where the professors are more numerous than their pupils, allows them to not be either "early school leavers" or "early" emigrants. The establishment of the University of Aegean located on 6 islands of the Regions of Vorio and Notio Aigaiio, of the University of Ionian Islands established in Kerkyra, of the Technological Institute of Ionian Islands located on Zakynthos, Lefkada and Kefalonia as well as of the University Institute of Gotland are examples of how the national governments in collaboration with regional authorities attempt to address the low educational and low innovation level of these areas. In the Greek case, the development of these Universities it was possible due to European financing.

Some common success factors of all the above cases can be summarized:

- **Good governance and local strategy**, intra-regional networking. In most of these cases, the driving force for the initiation of a project is the local government in association (cooperation) with different local stakeholders; the mobilization of endogenous forces is a starting point for the elaboration and the application of any strategy, all the more so this strategy is an innovative one.
- **Inter-regional networking** (interregional organizations and interregional cooperation programs) provided external scientific, organizational and financial assistance and mobilized the small and disparate regional and local authorities.
- **R&D and Innovation structures** are necessary for the adaptation and the efficient use of external innovations (i.e. wind power) but also of the existing local know-how (i.e. food production).
- **New skills of the human capital** are considered as necessary for the enhancement of local economies so local authorities tries to mobilize local population that has not the means to finance the acquisition of knowledge and skills out of the limits of the islands and/or abroad and local enterprises to employ them.
- **Extra financing** (European/national/regional) is necessary for the mobilization of the local stakeholders for innovative actions (i.e. green strategies, networking etc) and the provision of better public services to islanders.

**All the above factors are related to the attractiveness of the islands as already analyzed.** But their success has until now localized and isolated results with limited impact on the overall state of the islands<sup>43</sup>. The most important reasons seem to be:

- these actions usually address attractiveness issues partially and especially the indirect ones and therefore they seem to create necessary but not sufficient conditions to change existing trends;
- an overall strategy supported with specific policies, national or European, is missing.

Setting coordinated policies and integrated programs tackling all the attractiveness factors at the same time seems to be a more effective strategy.

Nevertheless, these success factors can be used as **“flagships initiatives”** within an Islands’ Strategy; this strategy could adopt most of the EU headline targets but with a different quantitative

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<sup>43</sup> As most of the above initiatives are recent, their impact is not reflected yet at the sustainability indicators

goal (i.e the target for R&D expenditure in islands cannot reach 3%, but spending 1% of the GDP for R&D could be a goal for islands).

It has to be underlined that island regions as Illes Balears and Åland –where a lot of best practices are found- are within regions with the best results in the sustainability State Index; these regions have also a very high governance performance. Some from the local initiatives of these regional authorities have to be mentioned:

- Agreement for Competitiveness, Employment and Regional Development (Illes Balears) signed between the regional government, the main employers associations and labor unions containing the basics of the future model of the Balearics and starting a process of wide-ranging policies.
- Citizenship forum (Illes Balears) for the promotion of the civic participation through a website making possible the bidirectional communication between government and citizens.
- Forum for the evaluation of public policies (Illes Balears)
- Strategic Plans (Illes Balears) with the elaboration of a plan for Science, Technology and Innovation showing the government's commitment to competitiveness through the use of knowledge as well as a master plan for the Energy Sector comprising measures for the use of natural gas, the development of Renewable energy, the decrease of energy consumption (energy efficiency) and interconnection with the mainland.
- The Archipelago Board (Åland) formed to ensure good, formal and informal communication between the Government of the Åland Islands and the six archipelago municipalities

### ***3.4. Typology of the islands***

A typology of islands that takes into account different island characteristics (both their common characteristics and the socio-economic disparities) **reveals how important the constraints linked to insularity are and constitutes the foundation for proposing policy measures tailored to the different island types.**

A previous classification of European Islands proposed by Planistat (2002) was based mainly on geographical characteristics of insularity rather than socio-economic ones: population, area, total GDP, distance from the regional capital, distance to find a population 15 times bigger than the island's population, average sea level elevation, average temperature and the ratio perimeter/area of the island). The statistical analysis yielded 3 categories for NUTS 2 and 3 regions (Cyprus and Malta were not included):

- Sicilia, Sardegna, Kriti (the very big islands)
- Balears, Voreio Aigaio, Notio Aigaio, Ionia Nissia, Corsica and Shetland (the big and medium mountainous islands and archipelagos of the Mediterranean plus Shetland as a remote archipelagos)
- Gotland, Bornholm, Åland, Isle of Wight, Orkney, Western Isles (medium / small and rather flat islands situated close to the European mainland).

The lack of new data for the majority of the variables identified in the methodology of this study, especially at NUTS 3 level, restricts the possibility for a more complete and thorough statistical analysis. With the amount of information available, a classification based on the size of the islands' permanent population was adopted in the current study as a starting point. **The study showed that the smaller the population of an island the more acute some of the insularity impacts, direct and indirect– e.g. higher costs to maintain equitable levels of public services.**

The initial classification used in the present study of NUTS 0 - NUTS 3 islands was based on population and produced the following results concerning the islands included in the analysis:

- **Very Big Islands** (more than 50.000 inhabitants): Sicilia, Sardegna, Mallorca, Cyprus, Kriti, Malta, Corse, Isle of Wight, Lesvos, Kerkyra, Gotland, Eivissa I Formentera, Menorca Dodecanisos (Rodos)<sup>44</sup>.
- **Big Islands** (between 5000 and 50.000 inhabitants): Chios, Samos, Bornholm, Zakyntos, Western Isles, Orkney, Kefalonia, Shetland, Gozo, Åland, Kyklades<sup>45</sup>. From the case study islands Kalymnos and Saaremaa belong to this subgroup.
- **Small islands** (less than 5.000 inhabitants): Kokar, Lipsi, Lipari and Samso (case studies).

In this study, five different indexes were calculated for island administration units and member states they are located in, as already mentioned previously (2.1.4): one for the state of the islands based on sustainability parameters (State Index); one for changes that have taken place during the period 2000-6 (Change

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<sup>44</sup> The first seven islands belong to the subgroup of the very big islands with more than 300.000 inhabitants; Dodecanisos even if it is an archipelago, is included in this subgroup because its main island (Rodos) has more than 100.000 inhabitants, although the rest of Dodecanisos consists of medium and small islands.

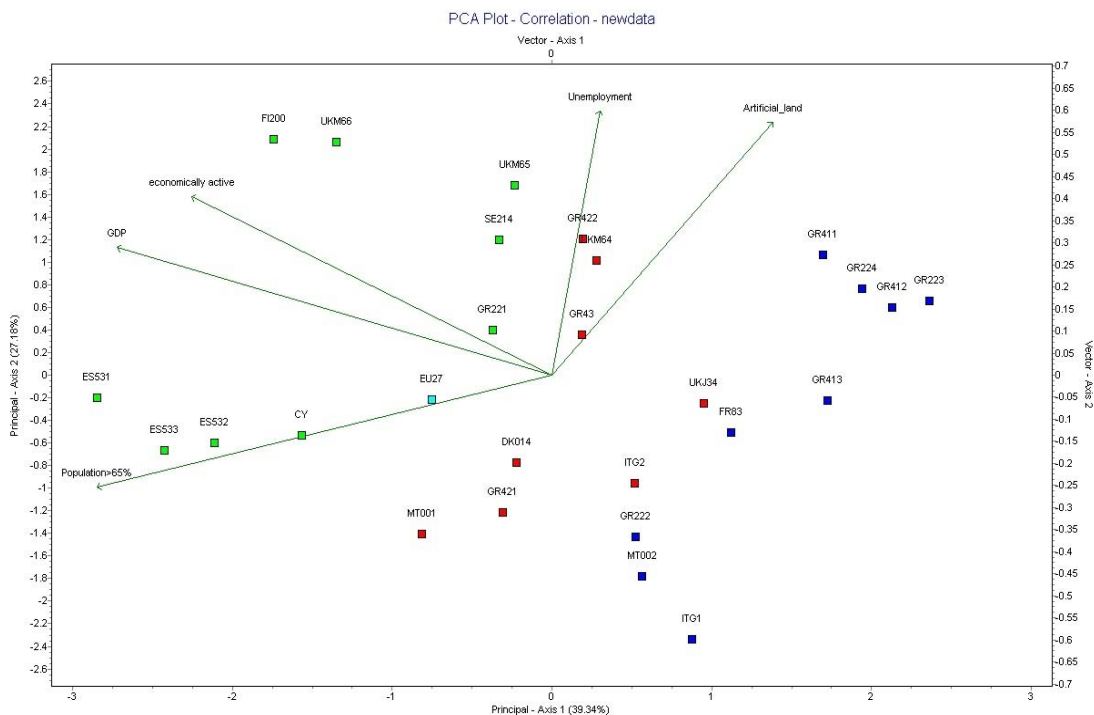
<sup>45</sup> Even if the total population of Kyklades is 104.000 inhabitants, it is an archipelago with 24 inhabited islands; only seven from its islands have more than 5.000 inhabitants.



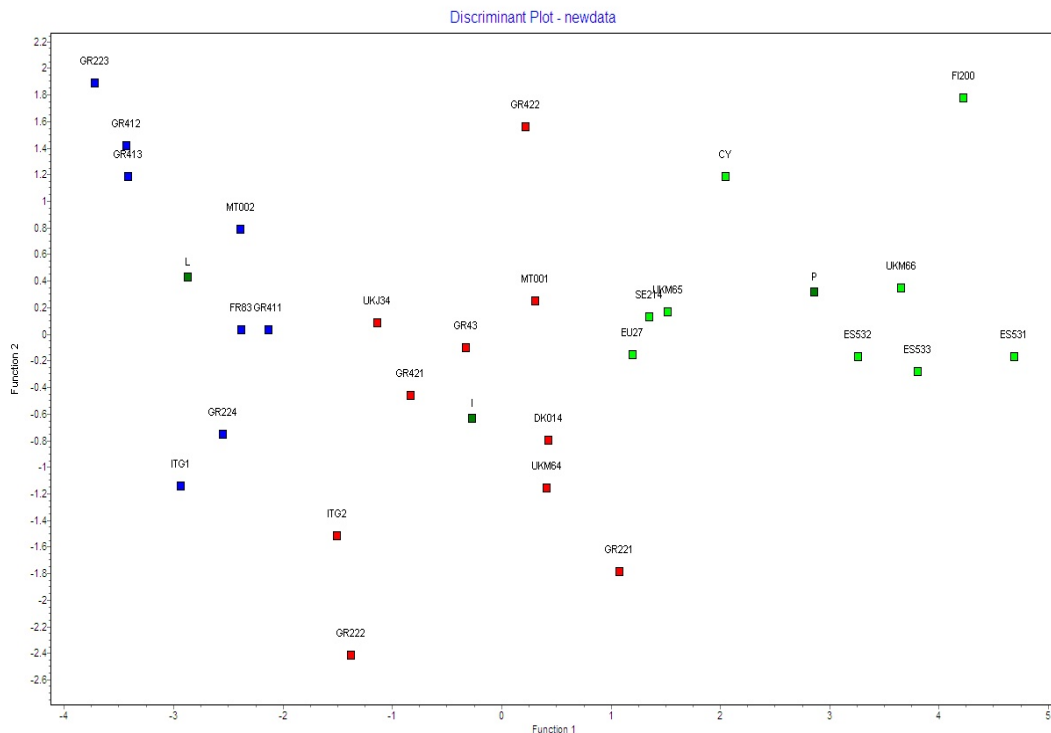
Index); one for the attractiveness parameters indirectly influenced by insularity based on issues of accessibility and urban dynamism (Direct Attractiveness Index), one for attractiveness based on indicators that cover the rest of the attractiveness factors (Indirect Attractiveness Index) and a last one for the natural and cultural assets (Assets Attractiveness Index).

The analysis of data already presented reveals a higher dispersion of values for islands than for member states for the State and Change Indexes; on the contrary the values of the indirect attractiveness index are less dispersed and for islands are close lower than the national ones. The classification of island regions is performed with 4 (except the artificialization indicator) and the 5 indicators composing the State Index. A Principal Component Analysis was firstly used to classify the islands (Graph 3.4.1) and it was followed by a Discriminant Analysis for verifying the groups (Graph 3.4.2), as some of the islands can be classified to both groups (e.g. Orkney and Zakynthos which can be classified either with the performing islands or with intermediate ones; Kerkyra and Sardegna are between intermediate and lagging islands).

Graph 3.4.1 Principal Component Analysis (5 indicators)



Graph 3.4.2 Discriminant Analysis (groups verification)



These results are associated with the islands population size, giving the classification that is proposed in Table S3.4.1:

- **Performing islands:** In this first group Åland, Illes Balears, Gotland, Cyprus, Shetland and Orkney present a positive and well balanced state drawn by a well performing but rather fragile economy. The bigger islands (Illes Balears and Cyprus) are classified here due to an "economic growth pattern" based on economic specialization (mass 3S tourism combined to a strong construction sector plus off-shore activities for Cyprus). These islands face high environmental pressures due to the type of tourism. Gotland (big island) and the medium size archipelagos regions of Åland, Shetland and Orkney are classified in this group due to external parameters and not due to endogenous dynamism: the public sector is important for Gotland (the GVA of the public sector for Gotland is 41,2%), a specific fiscal regime for Åland and the oil extraction platforms close to Shetland, rather than the utilization of local comparative advantages. In the case of Shetland and Orkney the presence of an important primary and manufacture sector (about 24% of the GVA) seem to make the difference from other Nordic islands with just an important public sector.
- **Intermediate islands:** In the second group there are ten islands with average results compared to the average performance of all islands. Some of the islands have an

important but apparently less well performing tourist activity such as Zakynthos, Kyklades, Dodecanisos, Kerkyra, Isle of Wight and Kriti; Malta and Sardegna have a balanced but not very performing economy; performances on Bornholm and Western Isles together with Isle of Wight are based on the importance of the public sector.

- **Lagging islands:** Chios, Lesvos, Samos, Kefalonia, Lefkada, Gozo, Corse and Sicilia, have low attractiveness (except Corse) and a low performing economy that influences negatively all examined parameters.

Table S3.4.1: Classification of NUTS 2 & 3 island regions and the case study islands

Size/state	Big islands	Medium	Small
<b>Performing islands</b>	<b>Mallorca</b> Menorca Ebissa i Formentera <b>Cyprus</b> Gotland	Åland* Shetland* Orkney* <b>Lipari</b>	
<b>Intermediate islands</b>	Kriti <b>Malta</b> <b>Sardegna</b> Isle of Wight <i>Dodecanisos*</i> (Rodos) <i>Kerkyra</i>	Bornholm Kyklades* Zakynthos Western Isles*	<b>Samsø</b> <b>Kokar</b>
<b>Lagging islands</b>	<i>Corse</i> <i>Sicilia</i> Lesvos	Kefalonia Chios Samos Gozo Lefkada <b>Kalymnos</b> <b>Saaremaa</b>	<b>Lipsi</b>

Notes: - The islands in bold are the case study islands.  
 - The islands in italics are the ones with high unemployment rate.  
 - With asterisk: Archipelagos. Sicilia, Sardegna and Kerkyra are also archipelagos but the biggest island is totally dominating the region.

This classification could be used to diversify the intensity of measures within an integrated insular policy. For instance "...the size of the population and hence of the local market is a major determinant of the development challenges faced by a given territory and the diversity of situations is likely to be much more limited within each subgroups of islands" (DG Regio, Annex VI, p.19). In islands with more than 500.000 inhabitants (only 5), agglomeration economies and economies of scale are possible; so the provision of Services of General Interest to islanders in these islands is feasible and at a lower cost than it is on smaller islands. Correspondingly, enterprises on bigger islands have more opportunities (bigger local market, better accessibility) than in small

islands. Generally speaking, **the cost of insularity has to be considered as bigger in small and mountainous islands, fact that can lead to a modulation of policy measures.**

This approach should not lead to the assumption that insularity cost is inexistent in bigger islands such as Sardegna with 1,5 million inhabitants; some of the components of insularity cost –e.g. accessibility cost- are still present and undermine their competitiveness. At the same time, it is useful to keep in mind the differences of size between islands and mainland regions; the effort on European level to create big (in population), efficient, attractive and competitive macro-regions at the European level (Oeresund, Baltic Sea, Danube etc) in order to improve European competitiveness at the global scale. Gaps between islands (even the biggest ones) and these regions as well as the European MEGAs and the European Pentagon area are growing and they have to be bridged by applying the right strategy and policies.

Another parameter that could lead to the modulation of policy intensity between islands is the different classes of islands based on their overall performance<sup>46</sup>; lagging islands have proportionally greater needs than performing ones in some domains. Archipelagos and double-insularity cases require special attention and existing data shadow existing and important intra-regional disparities.

A system based on the State and the Attractiveness Indexes could substitute the use of per capita GDP as the only indicator for determining the eligibility of regions and the types of policies to be supported by the EU Cohesion Policy. Additionally, the attractiveness criteria used within this study have a clear territorial dimension and can impress all territorial policies of EU.

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<sup>46</sup> The categorisation of islands should not be done at administrative units (NUTS 2 or 3) but at the level of each island, despite the extra statistical effort needed to collect or produce data on the island level.

## 4. Policy Analysis and Recommendations – Options for policy development for islands

In order to answer the third question (“What policies could be applied to increase the attractiveness of islands?”), an ex-post evaluation of European policies is required to examine whether the output of these policies addresses the attractiveness problem of islands. This is performed with an Island Impact Assessment of specific EU policies. The end result utilizes the findings of the IIA with the SWOT analysis and the proposed Islands’ Strategy 2020 to formulate recommendations.

All European policies have direct or indirect territorial impacts (EEA, The environmental dimension of environmental sustainability Annex VI – p.20-22); so all of them have an impact to the state of the islands. Following the specifications of the project the analysis is focused on policies related to: (a) the enforcement of entrepreneurial initiatives; (b) management and valorization of natural and cultural resources; (c) enhancement of human resources; and (d) Services of Public Interest. The policies assessed are related to these topics and are presented in Table S4.1:

**Table S4.1: EU - Policy area.**

<b>Policy area (project specifications)</b>	<b>EU-Policy</b>
Natural resources	Environmental policy
Human Resources	Regional policy- ESF
Entrepreneurship	Competition
Public services	Transport and energy
Entrepreneurship, Human resources	Regional policy – ERDF
Natural resources and entrepreneurship	Common Agriculture Policy

#### **4.1 Impact of European Policies to islands (improving islands' attractiveness)**

*"The development of a common concept for Territorial Impact Assessment (TIA) is necessary to support spatial development policies. The concept shall be of a cross-sectoral nature and include socio-economic, environmental and cultural indicators for the territory in question" (Informal Ministerial Meeting in Tempere, September 1999).* One decade later the TPG of the TIPTAP project declares that *"Three elements have to be highlighted: the fact that no common concept for TIA does in fact exist at present; the multisectoral nature of the methodological approach; the fact that the impact should refer to specific territories, those addressed to by development policies and not just to the general EU territory" (TIPTAP, 2009, final report, Part C, p.3).* TIA has to follow the principles of the Impact Assessment (IA) introduced by the Commission in 2002 to contribute to a more coherent implementation of the Sustainable Development Strategy through an assessment and a better coordination of sectoral policies. The main difference of the TIA lies in the fact that it has to assess the impact not only at the European level but also to specific types of regions (urban, rural, boarder, coastal, mountainous, insular, sparsely populated). The modulation of sectoral policies in order to take into account the territorial disparities is now under consideration.

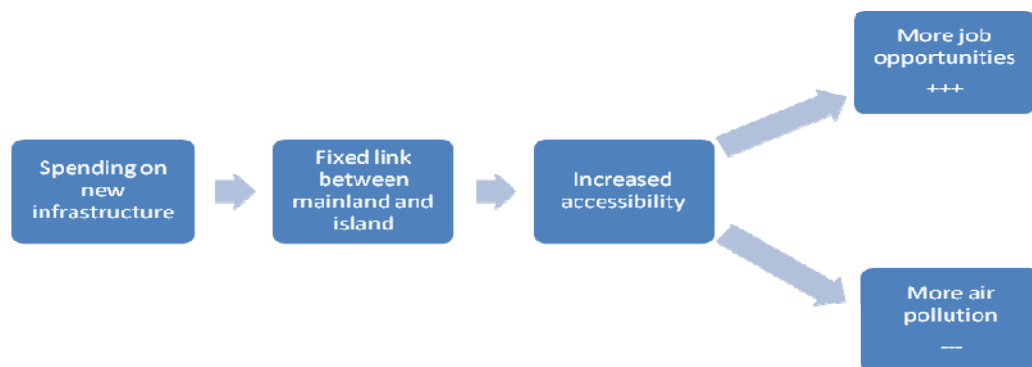
Island Impact Assessment (IIA) has to follow the general guidelines and steps<sup>47</sup> already formulated in order to use the existing information from previous analysis and to provide comparable results. But IIA has also to introduce in the analysis –especially in the designation of cause-effect relations- **the specific characteristics of islands**. As already mentioned, these characteristics influence the attractiveness of islands (the cause of the problems they face) and therefore also indirectly affect the sustainability state of islands. The integration of attractiveness and sustainability factors is performed via the initial conceptual framework of the project (Figure S1.1). The variables that are considered as critical are already used for the calculation of the Attractiveness and the State Indexes and the overall analysis. Within this approach, **the policies are considered as efficient for islands when their results modify positively in the short term the attractiveness parameters and influence thw sustainability parameters in the long term**. It has to be mentioned that every policy affects directly one or more

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<sup>47</sup> As formulated by ESPON progress on Territorial Impact Assessment (TIA, 29 January 2009, p.7) and by the TIPTAP final report (p. 6-12).

attractiveness parameters but not all of them; for instance the improvement of transport infrastructure (policy output) affects accessibility (the result) of an island (but not other parameters such as Labor Qualification or R&D) and has an impact to employment and air quality (impact) (Figure S4.1.1.).

Figure S4.1.1: Causal link between a policy measure, output, result and impact



The European policies are assessed through the following steps:

- a) Policy axes: definition of the policy intervention concerned;
- b) Territorial dimension of the policy: consideration if the policy has explicit, implicit or no territorial dimension<sup>48</sup>;
- c) Policy output: a general description of the main expected output of the policy;
- d) Policy result and impact: the parameters of islands' attractiveness and sustainability that have to be directly affected by the policy's outputs (cause-effect relation);
- e) Island Impact Assessment: the output of the policy in (selected) islands and the way (positive or negative, strong or weak) that attractiveness and sustainability parameters are affected in islands by these policy outputs.

It has to be underlined that the IIA is based: (a) on previous reports and other documents assessing European policies (mainly ESPON projects)<sup>49</sup>, (b) on data concerning the state and the attractiveness of the islands (c) on information from the case studies and (d) on TPG appreciation. The results of the TIP TAP project on CAP and Transport Policy ex-ante evaluation for the period 2007-2013 is also used.

<sup>48</sup> For the territorial dimension of EU policies, input from the EEA study "The environmental dimension of environmental sustainability" is used.

<sup>49</sup> It has to be underlined that the different projects having assessed sectoral policies have analysed a very limited number of policy axes.

An analysis of the territorial impact of sectoral policies was effectuated by ESPON based on studies of the 2000-6 program (ESPON 2006e, p.71-78); a very concise and general assessment is presented in Figure S4.1.2.

Figure S4.1.2 Sector policies results and territorial cohesion

Sector Policy	Territorial impact
Structural Funds	Help increase territorial cohesion across the EU, but have little impact in terms of cohesion between regions within a country; however, they can empower local authorities and stimulate local and regional innovation.
Pre-accession aid	Help increase territorial cohesion at EU level, but mixed results at national scale; contribute to institutional capacity-building regionally and locally.
R&D	Consolidate rather than change the geographical pattern of R&D at EU and national scales. However, many less favoured regions benefit disproportionately from the Framework Programmes, and the foundations are being laid that will eventually better connect them into the EU innovation system. Important benefits to territorial potential at the regional/local scale.
Transport	Contribute to cohesion in relative terms though absolute gaps may be widened. Pricing policy to reflect full costs of transport will disadvantage remote regions at European and national scales. Under-developed regions may benefit from infrastructure improvements.
Energy	Network development and market liberalisation should improve cohesion, but regions with low self-sufficiency in mainstream energy supplies and high sensitivity to price changes are at risk. Renewables could boost regional economies in rural areas.
Agriculture	Pillar 1 does not currently assist cohesion policy at EU scale and nationally. Pillar 2 has some beneficial local-scale impacts but overall could make a stronger contribution to cohesion across the EU.
LEADER	Has delivered tangible benefits in lagging regions and vulnerable rural territories. Lessons from LEADER might be transferred to other policy instruments.
Fisheries	FIFG funds may contribute to EU cohesion but are likely to work against cohesion within a country by aiding more prosperous communities most. While the overall picture is complex, Common Fisheries Policies could potentially make a stronger contribution to aiding cohesion.

The main conclusion of the ESPON report is that: *"mixed evidence on the coherence of sector policies. EU sector policies contribute at European level – if at all- rather coincidentally to territorial cohesion. This is because of diverging policy aims and lack of coordination. The contribution differs, however, from policy aims and often depends on the concrete policy strands and measures (ESPON 2006e, p.78).*



#### 4.1.1. Environmental Policy

The objective of the DG Environment is **to protect, preserve and improve the environment for present and future generations**. To achieve this target it proposes policies that ensure a high level of environmental protection in the European Union and that preserve the quality of life of EU citizens. The EU Environmental Policy contains a lot of axes concerning all the components of the environment<sup>50</sup> as well as tools for minimization of the impact from human activities on the environment (EIA and SEA directives). It receives funds from Cohesion Policy Funds and a special budget line (through LIFE), in total 12,6% of the whole European budget. Some of the axes have a major importance for islands as the Water Framework Directive (use the river basins as a key planning unit and management of groundwater), the Bathing Water Directive (monitoring systems for the quality of the water and identification of pollution sources), the Waste Framework Directive (concerning transportation, treatment, safe disposal and use of waste as resource), Habitats and Birds Directive (creating the Natura 2000 network through the identification of Special Areas of Conservation and Special Protection Areas) as they concern limited and precious resources.

All these policy axes create frameworks that the MS have to apply in order to cover their territory with management plans and to create appropriate infrastructure and mechanisms for the implementation of policies. EU finances these activities through the Structural and Cohesion Funds (around 19% of their budget is planned to go for environmental protection during 2007-2013)<sup>51</sup>. They have been implemented on islands in a different way depending on the MS action plans:

The Habitats and Birds Directive have resulted in Natura 2000 zones on many islands (Annex I, p.23, Table S3.2.14). Even if this policy has positive results, does it preserve biodiversity, habitats and species? No general answer can be given as no information exists to compare the situation before the implementation of the policy and today; information from the case studies (Mallorca) underlines that there are significant examples of recovery of the territory after the implementation of the directive.

Many actions were implemented towards nature preservation such as: a) the environmental impact evaluation of the hydrological plan

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<sup>50</sup> In the ESPON 2006 program the study "Territorial Trends and Policy Impacts in the Field of EU Environmental Policy" evaluated 3 axes of the Environmental Policy: water management, nature and biodiversity and civil protection in five cases studies.

<sup>51</sup> ECORYS Nederland BV, 2008, A Study on EU spending

of the Illes Balears; b) the creation of new 7 Natural Parks during the period 1988-2002; c) the creation of Menorca as Unesco's Biosphere Reserve; d) the establishment of a monitoring system for *Posidonia Oceanica*; e) the elaboration of territorial management plan for the Illes Balears' territory; f) the elaboration of a territorial plan of Menorca island; and g) the elaboration of a knowledge-based Integrated Coastal Zone Management in the illes Balears.

The Cypriot government has initially enrolled in the Natura 2000 Network 31 areas either as SPAs or as SCIs; this number increased to 38 in 2005 and more recently to 64 and covers an area of 2476,82 km<sup>2</sup> in the areas under the effective control of the government of Cyprus; thus the Natura 2000 area covers 26,8% of the total surface area of the island. This evolution shows a positive impact of EU regulation as management plans are being carried out.

Therefore, the result of this policy is positive as significant areas for biodiversity are placed under protection; in the case of Mallorca a recovery of natural vegetation and species is recorded after the implementation of the directive.

However, indirect information coming from the fragmentation index and the Regions' classification regarding their natural and environmental assets (EEA, 2010, Annex VI p.24), shows that pressures, related to the intensity of economic activities such as tourism, quarrying, transport or agriculture have not stopped (ESPON 2006b). This situation is more evident at the environmentally sensitive coastal area where more economic activities are concentrated (see the Cyprus case study). This kind of pressure is unavoidable within the current development model where economic efficiency has high priority compared to the two other components of sustainable development. Information from Corine land coverage and the classification of areas regarding their environmental assets (EEA 2010, Annex VI, p.24) in different islands as Illes Balears confirms this. Another way to assess the policy is to extrapolate the condition of the environment in the absence of this Directive; the decrease of biodiversity would be unavoidable, as habitats actually protected would be degraded and species extinct.

Concerning the Water Directive Framework its implementation didn't resolved problems of quality and availability of drinking water; on islands such as Mallorca and Cyprus a significant part of water demand is covered by desalinized water proving that water resources are permanently stressed .

The Blue Flags program's results are reflecting the positive impact of three EU policies (Waste Treatment, Water Bathing Directives and Cohesion Policy) and local governance. The use of an environmental quality "flag" as a marketing tool for tourism promotion has positive environmental as well as socio-economic impact: on Illes Balears there are 71 beaches and 22 marinas and in Cyprus 54 beaches with blue flag. This evolution is also an impact of policies for the construction of sewage systems in all the cities and most of the settlements with more than 2000 inhabitants.

In the case of solid waste treatment in Mallorca the system recently installed for treating all solid waste of the island will reduce pressures on soil and water resources; but recycling process is delayed. In Cyprus, the whole process has begun recently (under the actual Strategic Development Plan 2007-13 co-financed by EU) and there is a long way to go to cover EU regulations.

The results and the impacts of the above policy actions in the case studies of Mallorca and Cyprus are assessed as follows:

<b>Policy Actions</b>	<b>Parameters directly affected</b>	<b>Results/Impacts</b>
<b>Habitats and Birds Directive</b>		
Attractiveness	Natural heritage	3
	Employment opportunities	2
Sustainability	<i>Environmental conservation (biodiversity)</i>	2
	<i>GDP creation</i>	<i>positive</i>
	<i>employment</i>	<i>positive</i>
<b>Water Directive Framework</b>		
Attractiveness	Natural heritage	No information
Sustainability	<i>Environmental conservation (Drinking water availability and quality)</i>	<i>Negative (Water availability problems)</i>
<b>Waste Treatment directive</b>		
Attractiveness	Natural heritage	positive
Sustainability	<i>Environmental conservation (quality of the soil)</i>	<i>No information</i>
<b>Bathing Water Directive</b>		
Attractiveness	Natural heritage	+3
Sustainability	<i>Environmental conservation (quality of the sea water)</i>	+3

#### 4.1.2. Common Agriculture Policy (CAP)

The CAP was launched in Rome in 1957 and is the first common policy of the then European Communities. Its initial goals were the

provision of food for the populations of the Member States and viable incomes for farmers. It had two dimensions: (a) the 'market oriented' one, which was envisaged and used to guarantee prices and provide subsidies to producers according to the quantities produced, called the 'guarantee' part of the policy; and (b) the 'farm oriented' one, which sought to assist farms adjust and modernize and was called the 'guidance' part. In the first decades, the guarantee part consumed more than 90% of the total budget of the CAP; it is still the most important policy as it uses roughly 40% of the total budget.

The policy measures initially used were the community preference principle (that supported exports and taxed imports of products similar to these of European producers) and the common market in the member states. It was a very successful policy in terms of achieving its initial goals, as already in the 1970s the production was so high that the problems were the falling prices and the surpluses produced. There were also environmental problems (high pollution and threats to biodiversity), social problems (the subsidies were distributed very unevenly to productive areas and large farms resulting in 20% of the farms receiving 80% of the budget<sup>52</sup>), and economic problems, as more and more money were required, while European taxpayers questioned heavily the need for such a policy that produced food of low quality, used too much money that went to the rich farmers and many of the products had to be thrown away in the end.

Already in the 1980s reforms were applied and for the first time the second axis of the CAP, guidance, received some attention and a bigger budget. The really important reform was that of the early 1990s that introduced the so-called 'accompanying measures' that included new (agri-environmental measures, quality policy) and already existing measures (renewal of the farming population, assistance to farm infrastructure, Less Favored Areas (LFAs) policy that was introduced in the 1970s and seeks to help farmers in areas where agriculture faces restriction of a geographical or political nature such as mountainous areas and islands for the first case and border or remote areas in the second). These received more money from the budget and the guarantee axis was reduced significantly, along with the introduction of production levies. The continuous discussions of merging the CAP with the environmental policy, the need to address the World Trade Organisation's obligations of the EU, the on going 'de-agriculturalization' of rural areas and the need to promote quality instead of quantity, brought the 1999 reforms that united all the accompanying measures and new ones under one heading: Rural Development (RD) Policy (and not agricultural

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<sup>52</sup> ESPON 2013, TIPTAP final report part 3, p.23

policy) that was the 'second pillar' of the CAP and received more money from the budget. It also introduced the concept of the 'Rural Development Plan' that is an integrated plan as national and regional level for many Member States to identify problems of the rural areas and plan their addressing through a palette of available measures.

The reform was completed in 2003 with the introduction of the Single Farm Payment (SFP) that replaced the guarantee part of the policy (now receiving approximately 56% of the total CAP budget, ESPON 2004, p. 17). With it, the target was to decouple production from the subsidy and provide a single payment to farmers, regardless of their production for a five year period on the basis of historical data of production and land use. This payment is granted only for those that observe a certain set of environmental friendly practices called 'cross-compliance'. A part of the budget is given to the RD policy and to quality products.

Reviews of the pre-SFP CAP were very critical of the previous system in terms of its spatial impacts: *"Pillar 1 of the CAP appears to favor core areas more than it assists the periphery of Europe, while at a local level CAP favors the more accessible areas"* (ESPON 2004, p. 15) *"Total Pillar 1 support was generally higher in more accessible regions, and lower in more peripheral regions, at all scales – European, national and regional. Higher levels of CAP expenditure per hectare of agriculture land were found to be strongly associated with more prosperous regions. Thus because of the way that the market price support mechanism operates, Pillar 1 does not support territorial cohesion"* (ESPON, 2006e, p.76).

On the contrary, the RD policy was reviewed more positively: *"[it] has been of more limited effect. However, some components, such as agri-environmental measures in the more prosperous Member States, and the Liaisons Entre Actions de Développement de l'Economie Rurale (LEADER) Community Initiative in some regions, show promise in terms of effectiveness and EU-level cohesion"* (ESPON 2004, p. 15). *"The ex-post evaluation of LEADER II found the programme both efficient and effective. It proved to be adaptable to the different socioeconomic and governance contexts and applicable to the small scale, area-based activities of rural areas. It could therefore also reach lagging regions and vulnerablerural territories"* (ESPON, 2006e, p.76).

The ESPON 2006 Project 2.1.3., The Territorial Impact of CAP and the Rural Development Policy (Figures 14-18 - Annex I) underlines the above conclusions about the role of the two Pillars of CAP towards the Territorial Cohesion; it is obvious that payments from Pillar 1 are

directed to the big holdings of the rich countries, while Pillar 2 payments are contributing to bridge the gap. More specifically the agricultural holdings in Sardegna with structural problems (small holdings with low percentage of arable land and old farmers), the money they receive from the Pillar 1 is very low in comparison with holdings of central and north Europe.

ESPON 2013 TIPTAP project's analysis is based on the policy hypothesis of "modulation" of funds from Pillar 1 to Pillar 2 for the period 2007-2013 with an overall cut of resources distributed. Regions as Sardegna are not highly affected in their economic growth from this change and hope to get benefits from the diversification of the economy (tourism development) and the increase of environmental quality as now actions of Pillar 2 receive more funds comparatively to the past.

Sectoral assessments of the reform are positive but highly critical, such as the one assessing the impact to one of the targets of the new policy, preservation of biodiversity that is linked with High Nature Value (HNV) farm areas (EEA, 2009, p. 7):

*"Overall, the analysis suggests that, despite CAP reform and decoupling of subsidies from production, the majority of funding still goes to the most productive agricultural land. Relatively little is spent in areas with a high proportion of HNV farmland and particularly Pillar 2 support measures are inconsistently applied across Member States with a view to the objective of maintaining HNV farming. The distribution of CAP support across Pillars, measures and farm systems suggests that favourable management of HNV farmland is insufficiently supported".*

Regarding the spatial distribution of CAP payments, the ESPON study found that (ESPON 2004, p. 17-18):

*"The level of total Pillar 1 support was found to be generally higher in more accessible regions, and lower in more peripheral regions at all spatial scales (local, meso and EU-level). Multiple regression analysis shows that total Pillar 1 support is strongly associated with a region's average farm business size and land cover indicators. In contrast, Pillar 2 support was found to be higher in more peripheral regions of the community. In this case, multiple regression analysis found higher levels of support tended towards regions with smaller farm sizes while land cover variables were found to be less important explanatory factors. For both Pillars, after allowing for these other factors, no statistically significant relationships are observed with Gross Domestic Product (GDP) per head in NUTS3 regions. In other words, the strong tendency for Pillar 1 support to*

*go to richer regions of the EU-15 may be attributed to their larger farms, their location in the core of Europe, and their farm type. From the numerical analysis, then, it appears that the CAP has uneven territorial effects across the EU-15, which run counter to cohesion objectives, particularly in terms of its Pillar 1, and especially market price support. The "rural development" Pillar 2 may in some cases be more consistent with cohesion within countries, but runs counter to EUwide cohesion in the way it is currently structured."*

The most positive impacts are attributed to agri-environmental measures that are *"particularly suited to the encouragement of appropriate land management. The provision of support for organic production, given a high priority in several countries, has the potential to contribute to balanced competitiveness through high quality food production targeted at niche markets. Agri-environment programmes can also make an important indirect contribution to economic and social cohesion through the provision of income support in marginal areas, thus contributing to the retention of rural population"* (ESPON 2004, p. 21).

The LFAs compensatory payments are designed for livestock and therefore *"the scheme is largely correlated to the degree of farm net value added, i.e. higher compensatory amounts are applied in more prosperous regions, with much less use in "poorer" regions, largely because of national differences"* (ESPON 2004, p. 22). But, LFAs often coincide with HNV farming systems and therefore the scheme is beneficial *"for nature conservation and biodiversity, especially now that these payments are decoupled from livestock numbers"* (ESPON 2004, p. 22).

Finally, LEADER-type measures are considered positively, as they can *"stimulate processes in the local economy so leading to indirect but enduring benefits... especially in the improvement of intangible factors, in raising awareness, in strengthening strategy and cooperation within the region. This often builds the basis for the provision of better services and more competitive products in the longer term"* (ESPON 2004, p. 23).

An integrated program for rural development was implemented in Sardegna during the period 2000-6 following programs applied during the previous programming periods as well as a Leader II project. The fact that this program was designed in parallel with the Regional Operational Plan has created some planning and coherence difficulties as both of them had the same goal. Undoubtedly the implementation of such a program has a considerable output and significant results related to the goals of preserving and valorising

of natural resources (Agri-environmental measures, organic and integrated farming, agro-tourism), renewal of farmers, compensation of the lower income in LFAs etc. The impact is less positive either in economic terms (negative evolution of GVA in primary sector in current prices) or in employment terms; it seems that the interruption of export subsidies for pecorino cheese is one of the reasons of this decline.

The RD policy's positive but limited (insufficient) results in islands can also be confirmed from other cases as the Aegean islands where -even if there is a specific program applied to them - agriculture is declining, lands are abandoned and eroded with a high risk of desertification. The CAP has no positive derogations for islands in order to face a higher production cost; all European LFAs' are treated in the same way independently if they are in Belgium and continental Scotland or in Kokar and Western Isles where the cost of animal feed (i.e barley) used to be the double than in mainland (EURISLES, 2002, p.82).

<b>Policy Actions</b>	<b>Parameters directly affected</b>	<b>Results/ Impacts</b>
<b>CAP subsidies (Pilar 1)</b>		
Attractiveness	No attractiveness parameter are affected	
<i>Sustainability</i>	<i>GDP &amp; GDP per capita evolution</i>	<i>negative</i>
	<i>Population evolution</i>	<i>negative</i>
	<i>Age structure / % of population +65 years Active population rate %</i>	<i>negative</i>
	<i>income</i>	<i>negative</i>
	<i>Environmental Conservation</i>	<i>negative</i>
<b>Rural Development (Pilar 2)</b>		
Attractiveness	Employment Opportunities	+2
	Business competitiveness	+1
	Environmental and Cultural Heritage preservation	+2
	Governance quality	+2
<i>Sustainability</i>	<i>GDP &amp; GDP per capita evolution</i>	<i>positive</i>
	<i>GDP per capita convergence</i>	<i>negative</i>
	<i>Employment evolution</i>	<i>negative</i>
	<i>Population evolution</i>	<i>negative</i>
	<i>Women employment/activity rate</i>	+1
	<i>Poverty risk / income distribution</i>	Very positive
	<i>Environmental Conservation</i>	Positive

#### 4.1.3. Public Interest Services: Energy and Transport

Citizens and companies of Europe need a secure supply of energy at affordable prices in order to maintain standards of living. At the same time, the negative effects of energy use, particularly fossil



fuels, on the environment must be reduced. To achieve this goal, DG Energy focuses on creating a competitive internal energy market offering quality service at low prices, on developing renewable energy sources, on reducing dependence on imported fuels, and on doing more with a lower consumption of energy.

It is essential, then, for the EU to address the major energy challenges twh world faces today, i.e. climate change, the increasing dependence on imports, the strain on energy resources and access for all users to affordable, secure energy. The EU is putting in place an ambitious energy policy –covering the full range of energy sources from fossil fuels (oil, gas and coal) to nuclear energy and renewables (solar, wind, biomass, geothermal, hydro-electric and tidal)– in a bid to spark a new industrial revolution that will deliver a low-energy economy, whilst making the energy we do consume more secure, competitive and sustainable.

The Mission of the DG for Mobility and Transport clearly states that the EU’s overall policy agenda for transportation aims “to ensure mobility in a single European transport area, integrating citizens’ needs, environmental policy, and competitiveness.”<sup>53</sup> For this to be achieved several objectives need to be fulfilled including: ensuring all transportation modes within the EU are seamlessly integrated; ensuring that citizens have access to affordable transportation choices and can be guaranteed safety and security regardless of the mode they choose to use; ensuring that the transportation systems that are promoted meet the tenets of sustainable development; related to the previous objective, ensuring that the EU becomes a leader in green transportation systems; ensuring that the EU’s political and industrial interests in the global arena are protected.

The recently published Green Paper “*Towards a better integrated transeuropean transport network at the service of the Common Transport Policy*” has reiterated the EU’s long term objectives regarding transportation by pronouncing that the:

Trans-European transport network (TEN-T) policy aims to provide the infrastructure needed for the internal market to function smoothly and for the objectives of the Lisbon Agenda on growth and jobs to be achieved. It also sets out to help ensure accessibility and boost economic and social and territorial cohesion. It supports every EU citizen’s right to move freely within the territory of Member States. Furthermore, it

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<sup>53</sup> Ruete, Matthias n.d. Mission of the Directorate General for Mobility and Transport  
[http://ec.europa.eu/dgs/transport/doc/2010\\_05\\_move\\_mission\\_statements.pdf](http://ec.europa.eu/dgs/transport/doc/2010_05_move_mission_statements.pdf)  
(date accessed 14th June 2010)

integrates environmental protection requirements with a view to promoting sustainable development.<sup>54</sup>

According to this Green Paper, 400 billion Euros have been invested since 1996 in the TEN-T network, leading to the implementation of numerous projects, which have *inter alia* interconnected national networks and helped smooth technical barriers across borders. For example, national railways have been better integrated, thus making it possible for one to travel seamlessly through several countries. Improvements have also been noticed in recent years because of the ongoing transport objectives in terms of air pollution and road accident reduction, with many large cities, for example, noticing significantly improved air quality. However, more needs to be done to further rid urban areas of various substances that are particularly harmful to human health. Among the problems associated with the transportation-related projects implemented since the 1990s is that, in many instances, roads and other transport-oriented infrastructure have impinged on areas of important natural or cultural heritage leading, for instance to wildlife habitat loss. Additionally, in many cases, weak visioning considering the transportation/land-use interaction has led to excessive landscape fragmentation and contributed to sprawling development. This, in turn, has often meant that the sole realistic option for meeting people's transportation needs becomes the automobile, while other modes that are normally considered more sustainable (such as transit systems or bicycle greenways) cannot be supported efficiently due to low density of development patterns.

When talking about transportation-oriented policy measures we can think of the impacts as ones directly relevant to the improvement of accessibility. For instance, through the implementation of a measure relating to transport policy one could expect further development of infrastructure, thus leading to a higher frequency of service to a particular place. Better connectivity with a destination causes reduced travel time, presumably leading to lower total travel costs (both in total and per capita). In turn, improved accessibility leads to several consequences for a particular place, which relate to an indicator such as employment opportunities (one of the attractiveness indicators). If a place becomes more accessible it can be preferred as a source for certain goods and services and this could lead to more job creation. This in turn can be seen through measures like lower youth unemployment or more women in the labour force. In turn, the creation of more jobs in a particular place can have the follow-up effect of reducing out-migration (or even increasing in-migration). This relates to the social cohesion

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<sup>54</sup> Commission of the European Communities 2009, Green paper: TEN-T: A policy review.

indicator, which can be measured, for example, through the achievement of a more balanced age structure. From a negative standpoint, however, increased connectivity to a particular place may lead to an excessive increase in traffic, consequently causing elevated air pollution. This example can best be illustrated below:

To be sure, the environmental and other consequences that result from the implementation of a transportation-related policy have very much to do with the mode of transportation that is actually promoted through this policy. So, when a particular locality introduces public transit running on alternative fuels or chooses to promote the use of electric cars by installing battery chargers in various locations in an effort to green the environment then such measures would be considered positive from a sustainable development point of view.

In all, several island attractiveness parameters and indicators can be affected by the implementation of transportation policies. In addition to the accessibility parameter which is obvious (and can be expressed by measures such as increased service frequency and decreased cost of travel) we can add other parameters like public interest services, research and innovation, and employment opportunities. Additionally, as has already been seen, sustainability parameters can also be affected, as for example, economic effectiveness and the environment.

Three are the main axes of the EU policy for Energy and Transport that are going to be assessed:

- i) Transport Policy seeks to ensure connections among EU regions and also supports cooperation and projects in areas such as urban transport
- ii) Energy Policy promotes the development of renewable energy and energy system connections across the EU
- iii) Supports Trans-European Networks (TEN) for energy (e.g. electricity and transmission projects) and transport, including highways, roads, maritime and inland waters, combined transport and air)
- iv) Liberalisation of transport and energy services

The creation of the internal market has also an important impact to Energy and Transport Services as it has led to the abolition of State Monopolies through privatisations of existing public firms and establishment of new ones creating a competitive environment in order to ameliorate services and decrease prices to the consumer and indirectly to create more employment opportunities, more employment and GDP. The creation of the TEN leads directly to more accessibility (transport) and better (more efficient) energy

supply and indirectly to a more efficient European economy. Energy policy of renewable energy has as direct goal the decrease of CO<sup>2</sup> emissions and energy dependence from combustibles but also to boost the industry producing renewable energy systems.

The amelioration of the European transport network has no direct impact to Kalymnos accessibility; indirectly Kalymnos is "penalized" as the success of TEN policy makes Kalymnos less accessible at the European level than previously compared to other territories on mainland<sup>55</sup>. At the same time, in order to ameliorate the sea accessibility to the surrounding islands and the mainland, the municipality of Kalymnos has created a local company without any European financing. Kalymnos and Lipsi have not better accessibility due to the liberalisation of the transport market as the frequency of schedules and the tariffs have not ameliorated since then.

The liberalisation of transport services is not without problems for islands, even if legislation recognises their specific situation by authorising public service obligations. Nevertheless, this new legislative framework does not necessarily lead to better provision of services and cheaper accessibility, as the Corsican example reveals (EURISLES, 2002, p.83-84). Public Service Obligations do not concern international links, which are vital for Island States; e.g. Cyprus is not linked regularly with a maritime link for passengers with the EU mainland due to the limited economic interest of private companies in such a link.

EU policy for the promotion of renewable energy has direct and indirect positive results and impacts in Samso; the reduction of energy dependency and of CO<sup>2</sup> emissions as well as the creation of new investments (GDP and employment increase) with local participation and the creation of R&D and innovation structures (Energy Academy) are some of them. The creation of the brand name "Samso the green island" is also important for its overall development. Moreover, energy interconnections have direct and indirect impacts in small and isolated islands.

For example, Cyprus as an island and due to its location and geographical nature has a small and isolated energy system, which is far and detached from the trans-European energy networks (oil, natural gas and electricity). Thus, in order to ensure the security of supply and the uninterrupted physical availability of energy products in the market, at a price which is affordable for all consumers,

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<sup>55</sup> As expected, at the EU level the assessment of TEN-T policy shows benefits for the eastern countries and by increasing intra-regional integration on mainland areas but nothing for islands (ESPON 2013, TIPTAP, part B1, p.23)

Cyprus has to develop those policies and adopt certain measures, something which is very difficult to obtain due to the precarious and costly transport links. Furthermore Cyprus with less than 5% of total energy consumption supplied by renewables, oil imports are a considerable burden on the island's small economy (about 1 billion Euros, representing 14% of the country's total imports). It is obviously necessary to develop policies that will ensure security of supply at a price affordable to consumers, something difficult to achieve due to the precarious and costly transport links currently available. Cyprus must increase the share of renewable energy sources. Possibly catalysed by Directive 2009/28/EC for the promotion of Renewable Energy systems, recent developments in the field are encouraging as 6.7 MW of photovoltaic systems and 7.9 MW of biomass utilisation units have already been installed. Moreover, the operation of the island's first wind park with a capacity of 82 MW has just begun, while construction has started on five other wind parks, with a total capacity of over 75 MW. Cyprus is committed to increasing the contribution of Renewable Energy Systems to 13% of gross final energy consumption by 2020.

Certainly projects as Samsos, Green Islands and Pact of Island can help islands to meet 20/20/20 objective. But does this "success story" imply that EU energy policy (including energy networks) meets the need of islanders for "good" and "cheep" energy services? Certainly no for all the European islands as there is no plan to cover all the islands.

<b>Policy Actions</b>	<b>Parameters directly affected</b>	<b>Results/Impacts</b>
<b>TEN (Energy and Transport)</b>		
Attractiveness	Accessibility	negative
	Energy networks	negative
Sustainability	<i>Economic Efficiency</i>	<i>negative</i>
	<i>Social Cohesion</i>	<i>Negative</i>
	<i>Environmental Conservation</i>	<i>None</i>
<b>Competition policy – Privatisations (transport and energy)</b>		
Attractiveness	Accessibility	Negative
	Public Interest Services	Negative
	Employment Opportunities	Negative
	Competitiveness	Negative
Sustainability	<i>Economic Effectiveness</i>	<i>Negative</i>
	<i>Social Cohesion</i>	<i>Negative</i>
<b>Public Service policy</b>		
Attractiveness	Accessibility,	-2
	Public Interest Services (amelioration of mobile infrastructures and services)	-2
	Employment Opportunities,	-2
	Competitiveness	-2
Sustainability	<i>Economic Effectiveness</i>	<i>Positive</i>
	<i>Social Cohesion</i>	<i>Negative</i>

<b>Renewable energy</b>		
Attractiveness	Environmental preservation 20/20/20 objective	+2
	Employment opportunities	+2
Sustainability	<i>Economic effectiveness</i>	<i>Positive</i>
	<i>Social Cohesion</i>	<i>Positive</i>
	<i>Environmental Conservation</i>	<i>Positive</i>

#### *4.1.4. Human Capital Policy: ESF action – Cohesion policy*

The European Social Fund (ESF) represents a means of empowering people to create and acquire better jobs. It is one of the EU's Structural Funds, and has been one of the tools for the improvement of skills in order to reduce the divergence between different European regions, since the very beginning of the European Community in 1951 in the form of the Fund for the Retraining and Resettlement of Workers, (it was officially renamed as the ESF in the Treaty of Rome in 1957). Through the promotion of increased employment possibilities, the EU aims to support territorial cohesion, both in economic and social terms.

Since the 1950s, the Fund has focused on different aspects of job creation and the training and skilling of workers. Each decade had a more deliberate focus depending on international developments and regional/national demands. The 1990s saw a shift from focusing on unemployment to one focusing on employment. Globalization demands and the growing importance of the information society also had their impact on several changes. The fund looked to encourage those already in employment to retain such jobs by retraining. The fund also set up major community programmes (Euroform, Horizon, Now, Youthstart, Integra, and Adapt). Funding available under the ESF more than doubled and the amount directed towards the less developed regions increased to almost 70% of ESF funds.

Over the years, the ESF has been the basis for the EU's strategy for the creation of jobs and growth. More recently in the new century this has been the foundation for the Lisbon Agenda and more recently the 2020 Growth and Jobs strategy. Funding is available to all member states but focuses particularly on those regions where development is needed more. In the present budgeting period (2007-2013) almost €76 billion are earmarked to be allocated for the promotion of growth and jobs under the ESF, which is over 8% of the EU's total budget. The ESF is thus the financial foundation for the European Employment Strategy. More than two thirds (69%) of funding is earmarked for 'Convergence' - allowing up to 80% of co-funding – aimed at improving job creation and employment opportunities; and the remaining 31% going for regional

competitiveness, focusing on building successful globally competitive economies. The ESF has six main fields under which programmes can be financed, as shown in Table S4.1.1 below.

Table S4.1.1– Fields for Financing under the European Social Fund

	<b>Fields for financing</b>	<b>% of total budget</b>
1	Improving human capital	34
2	Improving access to employment and accessibility	30
3	Increasing the adaptability of workers and firms, enterprises and entrepreneurs	18
4	Improving social inclusion of less-favoured persons	14
5	Strengthening institutional capacity at national, regional and local level	3
6	Mobilization for reforms in the fields of employment and inclusion	1

Source: European Union

On average, every year over 15 million people benefit from ESF programmes: including the unemployed/inactive (5 million); women (4.7 million); under 25 (3.2 million); over 54 (1.4 million); ethnic minorities/migrants (0.6 million); and the disabled (0.3 million).

There are two main policy axes that are going to be evaluated:

- The European Employment Strategy seeks to support skills and a better functionality of the labour market through national plans
- The intervention through the European Social Fund into disadvantaged regions and regions in economic restructuring to improve skills of employees, women, young and unemployed people by supporting educational, training and lifelong learning programs.

The application of different programs financed by ESF for human capital in regions of objective 1 and 2, activity rate and the labour qualification in islands remains low. In Illes Balears it is observed that qualified workers leave islands as a consequence of a non developed qualified labour market. At the same time, this kind of labour market (basically tourism and construction) attracts non qualified workers from the mainland and abroad because of easiness on finding a job. From this point of view the impact of the applied policy is ineffective in long term; in Lipari different programs are effectuated for women, young people etc. Five projects have been materialized during 2000-6 period ; two under the APQ Local Development Plan for small islands; and three under the PIT (Territorial Integrated Plan for Minor Outlying Islands) initiative. The PIT initiative incorporates all outlying islands designed as a network forming a 'park', a unique concept for the Mediterranean,

based on cultural identity, territorial and environmental quality and the promotion of the area constituting “a container of multiple realities, wealth and resources that need management and organization of spaces that reconciles all the different aspects of a given territory”<sup>56</sup>. Total funds allocated for the five projects amounted to almost 2.4 million euro. The target groups varied and covered both public entities and private business participants. One project was particularly focused on the young unemployed. Unfortunately, only minimal information is available for the fifth project, which provided for the support of new female entrepreneurs in the areas of crafts, childcare, restoration, and tourism related activities. The result was that four women actually started their own business; so the programs are assessed as positive from the stakeholders.

On Mallorca and the Illes Balears in general, ESF actions have no positive impacts as all the indicators of education and training, of the % of population with high educational level, unemployment rate and change of unemployment etc have not been improved.

Policy Actions	Parameters directly affected	Results/Impacts
<b>Training – Life long Learning</b>		
Attractiveness	Labour qualification	negative
	Employment opportunities	positive
	Productivity	negative
Sustainability	% Active population	positive
	% unemployment	negative
	risk poverty	positive

#### 4.1.5. Entrepreneurship: Competition, Regional and R&D policy

The enforcement of entrepreneurial initiatives can be direct (state aid system, networking, internal market regulations,) or indirect through the amelioration of the “economic environment” (knowledge and innovation mechanisms, labour qualification, infrastructures etc). Competition Policy assures the implementation of the internal market controlling the State Regional Aid Systems (to be focused on lagging regions) and co-finances it through structural funds. EU –through its Enterprise and Industry Policy operates the Enterprise Europe Network with centers for SMEs across Europe. These centers implemented into big towns far away from islands’ very small enterprises which have no access to their services.

<sup>56</sup> [http://www.consorzioecoart.it/isole\\_eolie.htm](http://www.consorzioecoart.it/isole_eolie.htm)



Competition Policy in the EU is designed to ensure that trade between member states takes place on the basis of free and fair competition and that state barriers to such trade, when dismantled, are not replaced by private barriers which fragment the single market. The European Commission closely monitors collusions such as price-fixing arrangements, agreements to market/produce a product within a specified geographical area only, and forms of prohibited horizontal agreements (such as collective boycotts, tying-in arrangements, and discriminatory agreements between third parties).

The creation of the internal market is not without problems for the islands' economy. The difficult adaptation of Maltese enterprises to the internal market is a proof of the problems of small isolated economies to be competitive. Most of Malta's industrial enterprises are extremely small. More than 75% of Malta's industrial undertakings employ less than 5 workers. Many of these firms had been sheltered from foreign competition by protective trade legislation, outright bans, price controls and by stringent tariff and non-tariff barriers. In 1989, the Maltese government began liberalising industrial imports by replacing quantitative restrictions with an import levy. But tariff protection (including excise duties) remained high: between 15% and 130% on Community products; between 25% and 140% for non-Community products. In the absence of any value added tax (VAT), such high customs tariffs also had an important revenue generating function. These barriers to fair trade were amongst the most significant points of the EU's *avis* (opinion) on Malta's application for EU membership (European Commission, 1993). VAT has now been introduced<sup>57</sup>, all these barriers dismantled, and imports liberalised; various small firms have not been able to stave off the competition of branded foreign products, now more competitively priced. In the run up to EU accession, and to compensate for the overall impact of the dismantling of protectionist measures, Malta has implemented a comprehensive strategy for the development of SMEs and the craft sector. The main planks of this initiative included the setting up of a small business efficiency unit, a business incubator centre, a national crafts council, and regulations providing legal protection for small businesses in their dealings with large firms and public enterprises. This policy was not able to stop the decreasing of the

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<sup>57</sup> Few EU territories are exempt from EU legislation in terms of indirect taxation as French overseas, Canarias and Åland; Azores, Madeira, Corse and Aegean islands have the possibility on a permanent basis or for a transitional period to apply certain reduced rates. All the others are subject to common low accentuating inequalities as consumer prices are very often much higher in islands.

sector but consumers have access to more products and better prices.

State aid in particular is notoriously complicated; and various EU governments continue to practise it in some form or another. In principle, state aid is anti-competitive: yet, various fiscal and non-fiscal instruments continue to be developed throughout the EU, intended to support economic growth, encourage investment, address regional disparity, assist restructuring firms in financial difficulty, and support employment. In Malta, the most substantial of these supports have been grants and subsidies extended to the ship-repair and ship-building sectors. Following negotiation and EU accession, such fiscal instruments have largely been wound down or phased out. A 'state aid monitoring board' persists within the Ministry of Finance<sup>58</sup>. After having been granted a subsidy extension for a transitional period of few years, state owned Malta Shipyards has recently been sold to private operators.

Since 2007, there is a very limited positive discrimination for State regional aid in islands only for those with less than 5000 inhabitants<sup>59</sup>, as it exists for the outermost and the low density regions independently the GDP/per capita level but also for regions with GDP per capita lower than the EU-25 average or unemployment over 15% higher than the national average (EU Treaty, article 107,3 c); so enterprises in other insular areas have to compete with European mainland ones under unequal circumstances creating additional cost (i.e stocks' management, transport cost, energy cost<sup>60</sup>).

R&D regional programs applied to most of the island regions had a temporary output and insignificant results if the share of GDP and employment in R&D is considered.

A very important tool for islands' development in general and for the "enforcement of entrepreneurial initiatives" in particular is the financing coming from structural and cohesion funds as it uses 31,7% of the European budget. The actions financed by these funds (transport and environmental infrastructure, human capital, knowledge, innovation and enterprises are the main beneficiaries) aim to ameliorate the competitiveness of the lagging regions. The outputs of this policy are positive but the results -which depend on different parameters including the quality of programs and their

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<sup>58</sup> <http://finance.gov.mt/page.aspx?site=MFIN&page=monitoring>).

<sup>59</sup> It is very important to underline that this provision is made not at the NUTS2 level as usually for Cohesion Policy measures but at the LAU level, considering the problem of double insularity.

<sup>60</sup> CCI Haute Corse, 2002, Les PME face aux handicaps insulaires.

implementation (governance)- are not so positive as expected since the attractiveness parameters are remaining low compared to EU-27 average; the case studies in Kokar and Samsø are confirming low impact of these policies.

The financing through Cohesion Policy concerns mainly the "Convergence" (ex-Objective 1) regions independently if there are insular or not. Island regions and islands belonging to NUTS 2 regions with "high" GDP/capita as Illes Balears, Åland, Isle of Wight<sup>61</sup>, Gotland etc as 'Regional Competitiveness and Employment' regions during 2007-13 programming period and objective 2 during 2000-6 are receiving low per capita financing from cohesion policy funds. An important shortage of this policy is that it "lacks an integrated approach to face problems derived from insularity"<sup>62</sup>

<b>Policy Actions</b>	<b>Parameters directly affected</b>	<b>Results/Impacts</b>
<b>State Regional aid system</b>		
Attractiveness	Competitiveness (incentives to business)	negative
	Employment Opportunities	negative
<i>Sustainability</i>	<i>Economic Efficiency</i>	<i>negative</i>
	<i>Social Cohesion</i>	<i>negative</i>
<b>Cohesion policy</b>		
Attractiveness	Employment opportunities	positive
	Business competitiveness	negative
	R&D	negative
	Environmental and Cultural Heritage	positive
	Public Interest Services	
	Accessibility	
	Public Interest Services	negative
	Employment Opportunities	negative
<i>Sustainability</i>	Competitiveness	negative
	<i>Economic Effectiveness</i>	<i>negative</i>
	<i>Social Cohesion</i>	<i>negative</i>
	<i>Environmental Conservation</i>	<i>positive</i>
<b>R&amp;D Regional Plans and Research Framework Program</b>		
Attractiveness	Research and Innovation	negative

<sup>61</sup> Isle of Wight was not even an Objective 2 area during 2000-6, as South East Region is a "rich" one.

<sup>62</sup> Included in the answer provided from the regional authorities of Illes Balears to the query on "Best Practices and European Policies"

	Labour qualification	negative
	Productivity	negative
	Employment opportunities	negative
<i>Sustainability</i>	<i>Economic Effectiveness</i>	<i>negative</i>
	<i>Social Cohesion</i>	<i>negative</i>

This analysis demonstrates the difficulty of acquiring quantitative results and assessing the impacts from all EU policy axes. The assessment is based not on direct information but on information already collected on attractiveness and state indicators.

Some general observations come out from the above analysis:

- As ESPON already reports, **EU sectoral policies contribute at the European level –if at all- and rather coincidentally to territorial cohesion, and therefore much less for islands' attractiveness and sustainability,**
- EU sectoral policies outputs and results are not necessarily **adequate and/or strong enough for changing islands' attractiveness and state.**
- Almost all EU sectoral policies treat EU territories in the same way independently of their particularities and this is **discriminating towards territories with specific characteristics as islands.**
- EU sectoral policies have sectoral goals (such as the increase of accessibility for transport policy, the decrease of CO2 emissions for energy policy) and general goals for the EU level (such as the increase of productivity or competitiveness of the European economy); **so the divergence of results and impacts of these policies to different territories are not considered at all.**
- **EU policies have no territorial coordination – integration;** so measures of different policies may have contradictory results and impacts (i.e TEN and competition policy in one hand and policies targeting accessibility through Structural Funds in the other), **or no positive results at all as they address only few of the attractiveness problems.**

A summarization is presented in Table S4.1.2.

Many times the IIA suggests that the efficiency of policies and programmes mainly depends on national and regional governance giving perhaps the impression that insularity has no impact; the fact is that the efficiency of a policy is lower in an island region in comparison with the efficiency of the same policy on the continental area of the same MS; this stands for infrastructure construction, for training courses, for environmental management as economies of scale are not possible and the transfer of personnel, resources and

machinery on islands costs. At the same time human capital in an island region is lower than in the mainland; this fact implies less competences and know-how for effective planning in the islands of a MS than on his mainland.

Table S4.1.2: Summarization of Policy Assessment

EU-policy Policy axes	Territorial dimension	Policy Output	Attractiveness/ <i>Sustainability</i> parameters directly affected	Islands Impact Assessment (compared to the EU mainland)
<b>Environmental policy</b>				
Water Framework Directive	Explicit (water catchment zones)	Management plans obligation	Natural Heritage <i>Natural Conservation (fresh water availability)</i>	Positive. Differentiate results as efficiency of policy depends on National and Regional Governance and low impact (problems of water availability in most of islands)
Habitats and Birds directive	Explicit	Designation of Protected areas and Management Plans	Natural Heritage (% of Natural Zones) Employment opportunities <i>Natural Conservation (biodiversity)</i> <i>GDP, Employment</i>	Positive. Differentiate results and impacts as efficiency of policy depends on National and Regional Governance and on increasing pressures
Bathing Water directive	Explicit	Controls and Management Plans to prevent land based pollution	Natural Heritage <i>Natural Conservation (quality of sea water)</i>	Positive results and impacts
Waste Framework Directive	Implicit	Recycling Systems obligation for treatment and recycling waste Water treatment systems obligation. High cost of implementation	Natural Heritage Employment opportunities <i>Natural Conservation (fresh water and soil quality)</i> <i>GDP, Employment</i>	Differentiate results and impacts as efficiency of policy depends on National and Regional Governance influenced by high cost of insularity
<b>Common Agriculture Policy</b>				
CAP Subsidies	No explicit territorial dimension, but activities affect strongly territories	Revenue growth concentrated to developed areas and big exploitations (75% of the budget)	<i>GDP &amp; GDP per capita evolution</i> <i>Income</i> <i>Employment evolution</i> <i>Population evolution</i> <i>Age structure / % of population</i> <i>+65 years Active population rate</i>	(-) negative results and impacts for islands as it provides more assistance to farmers in favourable areas (big farms, in areas of plains, close to markets, etc.) increasing difference of competitiveness between productive and less productive areas.

			% <i>Environmental Conservation</i>	
Rural development	Focus on rural areas and on LFAs (all islands are LFAs as well as parts of the mainland)	RD plans per country. Promotion of local Governance (Leader). Differences for LFAs. It provides: - incentives for investments - public investments for the improvement of the quality of life in rural areas (including islands) - additional incomes for farmers in LFAs	Employment Opportunities Business competitiveness Environmental and Cultural Heritage preservation Governance quality <i>GDP &amp; GDP per capita evolution</i> <i>GDP per capita convergence</i> <i>Employment evolution</i> <i>Population evolution</i> <i>Women employment/activity rate</i> <i>Poverty risk / income distribution</i>	(+) rather positive results for islands but insufficient impacts in order to keep activity, population, agricultural land use in order to avoid erosion, loss of distinctive landscape and to produce environmental services.
<b>Transport and energy</b>				
TEN (transport and energy)	With strong territorial dimension	New infrastructures and amelioration of links between MS. Promotion of Multimodal Transport. Creation of a "real" internal market	Accessibility (Reduction of transport time and cost – amelioration of security) Environnemental Fragmentation – Pollution / Environnemental and Cultural Heritage (Pressure on environmental capital) Economic Effectiveness	Without results in islands Negative impacts as TEN ameliorate the situation in European mainland and not consider islands as art.170 of Lisbon Treaty asks.
Competition policy – Privatisations (transport and energy)	Implicit	Free Competition for lower prices and better service	Accessibility Public Interest Services Employment Opportunities Competitiveness <i>Economic Effectiveness</i> <i>Social Cohesion</i>	Positive results in big islands Negative results and impacts in medium and small islands

Public Service policy	Implicit	Public Service Obligations - National policies/funding	Public Interest Services (amelioration of mobile infrastructures and services) Accessibility, Employment Opportunities, Competitiveness <i>Economic Effectiveness</i> <i>Social Cohesion</i>	Fragility of the system as private company can go out of business Probable diminution of local employment and income Competition and amelioration of service is not guaranteed even in bigger islands
Renewable energy	Implicit	Renewable energy projects (Covenant of Mayors, Green Island, Pact of Islands)	20/20/20 objective Employment opportunities <i>Economic effectiveness</i> <i>Social Cohesion</i> <i>Environmental Conservation</i>	Positive results and impacts depending on Regional Governance
<b>Regional policy-ESF</b>				
Training – Life long Learning	Explicit focus on less developed areas	Organisation of training courses for employers, employees and unemployed – young and women	Labour qualification Employment opportunities (women, young) <i>Social cohesion (Active population %, unemployment %, income and income distribution)</i>	Low output (mainly in small islands) and inefficient results and impacts (skills and employment rate remain low). Efficiency of policy depends also on National and Regional Governance
<b>Competition</b>				
State Regional aid system	Explicit - Regional aid focus on less developed regions	Financial aid to companies. No positive discrimination for islands	Competitiveness (incentives to business) Employment Opportunities <i>Economic Effectiveness and Social Cohesion</i>	Inefficient results; low impact as economic activity and activity rate remain low.
<b>Regional policy – ERDF</b>				



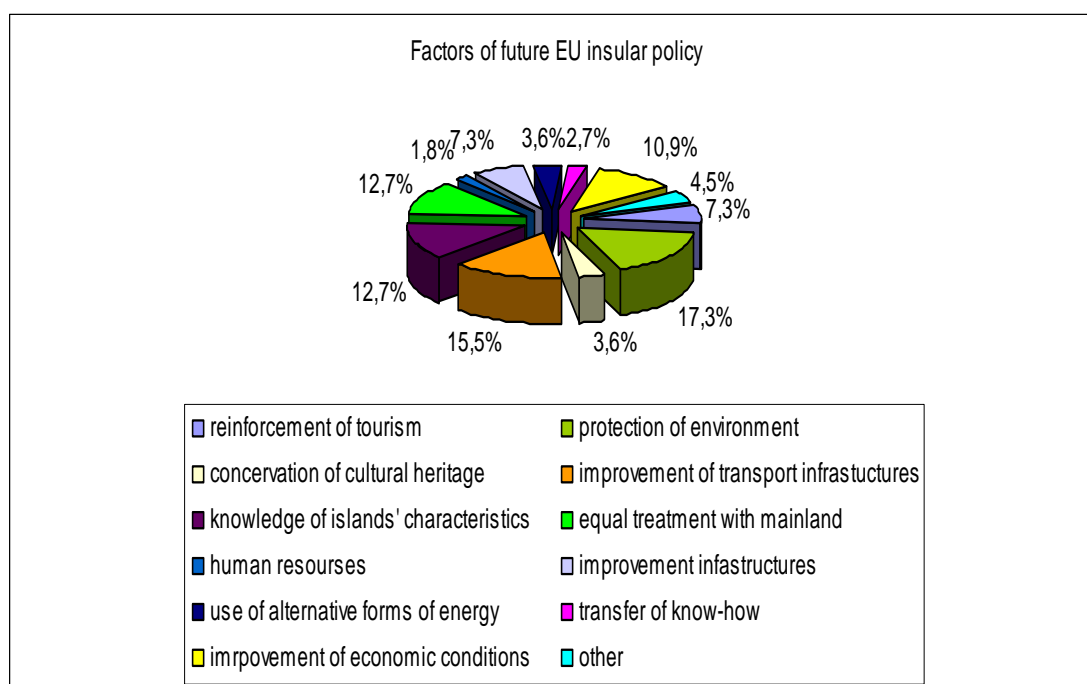
Cohesion policy	Explicit focus on less developed areas (Convergence Objective)	Regional operational programs' elaboration and implementation	Employment opportunities Business competitiveness, R&D Environmental and Cultural Heritage Public Interest Services Accessibility <i>Economic effectiveness</i> <i>Social Cohesion</i> <i>Environmental Conservation</i>	Positive but inefficient results for attractiveness amelioration Inefficient impact "Developed" islands are as mainland regions under 'Regional Competitiveness and Employment' objective receiving very low EU funds. All islands are not considered as boarder areas (internal or external) in order to participate in the cross-boarder cooperation
<b>R&amp;D – Innovation</b>				
R&D Regional Plans	explicit	R&D Regional Plans	Research and Innovation (% of GDP and employment in R&D – Patents) Labour qualification Employment opportunities <i>Economic Effectiveness</i> <i>Employment</i>	Inefficient results; Without impact. Efficiency depends on National and Regional Governance
Research Framework Program	No		Research and Innovation (% of GDP and employment in R&D – Patents) Labour qualification Employment opportunities <i>Economic Effectiveness</i> <i>Employment</i>	Inefficient results; Without impact.

## 4.2 Analysis of policy options for Territorial Cohesion

As the analysis of the study revealed, the most significant reasons for the current situation of the European islands (i.e. low attractiveness, developmental lag against the continental mainland regions) are related with the characteristics of insularity and the lack of adapted or insufficient implementation of European policies<sup>63</sup>. Furthermore, the analysis identified the need for the adoption of an alternative strategy which could lead to a balanced and sustainable development of the European islands.

Local authorities when asked<sup>64</sup> to define the factors that a future insular policy should take into account they identified thirty seven different parameters that should be included in a future policy. The categorization of these factors' leads to the identification of twelve policy areas as shown in diagram S.4.2.1

Graph S4.2.1: Factors that should be included in a future EU insular policy.



<sup>63</sup> The local authorities within their responses at the questionnaire of "Best Practices" about the implementation of a insular policy remark that in despite of several decisions asking for an island's policy from the different European bodies and the provisions of the Treaties there is no specific policy established yet.

<sup>64</sup> As above

The majority of the participants in the query (17.3%) believe that **the protection of environment is of high importance and for this reason a future insular policy should not ignore that factor**. Preservation of natural resources includes the green development, the promotion of recycling as well as the protection of the environment.

Even though the main orientation of insular policy is to secure the social cohesion it seems that the existent measures are not enough. For this reason 15.5% of the respondents supported that **future measures should consider the further improvement of transport infrastructures, in order to facilitate the connectivity of territories and the mobility of goods and people**.

12,7% of the participants expressed the opinion that all the insular policy measures, independently of the application field, should take into consideration the special conditions that prevail in islands, their uniqueness, as well as the fact that islands are exposed to exogenous shocks. **Some of the participants referred that this is a reason for which European insular policy has failed to confront islands' problems, in an overall perspective**. In addition to this, 12.7% of the respondents mentioned that an **insular policy should aim at the equal treatment of the islands with the mainland**, since they judge that the orientation of measures are developed according to the needs of mainland and are implemented to islands without the previous investigation of islands deficiencies, special conditions and needs.

Another 10.9% of the participants believed that different kind of measures, actions and policies should aim to the improvement of the conditions in order for the islands to achieve and maintain a sustainable economic development. Such measures could be the tariff elimination, fiscal incentives, business subsidies programs, improvement of services' quality etc.

The reinforcement of tourism sector with appropriate measures is considered to be a parameter for a future insular policy by 7.3% of the participants. Respondents proposed a specific orientation towards the development and promotion of alternatives forms of tourism. They also believed that tourism sector is very important for islands' "economic survival" since it is a core business for most insular areas.

Participants in general referred to the infrastructures problem faced by their islands. 7.3% of them are referred to the creation of infrastructures that would serve islanders' needs. These concern the

creation of new schools, health centres and also the extension and improvement of the existing ones.

Respondents believe that culture is a factor of distinctiveness and also a factor of attraction. Future insular policy should include measures and actions for maintaining island's cultural heritage (3.6%). This could be combined or included in a wider framework of tourism policy.

A number of responses (4%) referred to energy policy and the use of alternatives forms of energy and proposed the inclusion of this factor in a future insular policy.

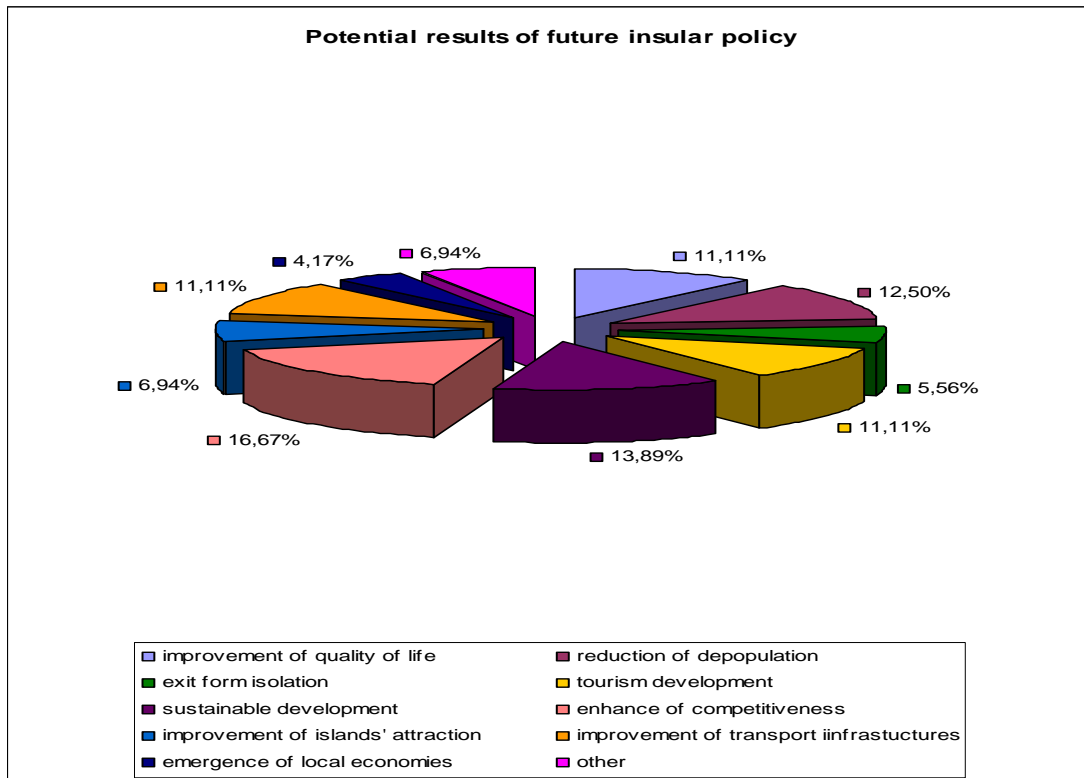
The lack of qualified labor is confronted as a serious deficiency of insular development but only 1.8% of the participants refer to this disadvantage of islands' economies and express the opinion that European policy should create measures for solving this problem which create constrains and limitations for further development while at the same time reduces the quality of the provided services. Again the proposal is very specific: the development and the application of educational programs for the creation of qualified labor.

A low percentage of the respondents (2,7%) expressed the opinion that a future European policy for the islands should include measures for attracting research on new technologies and innovation.

Finally, the rest 4,5% represents other proposed parameters that should be included in future insular policy such as: improvement of administration via elimination of bureaucracy, common agriculture policy for islands and efficiency of policy measures. Finally, respondents believe that the center of islands development, independently of the kind of measures or the field of policy, should be the islanders and the satisfaction of their needs.

The last question in the query aims at recording the opinions of the respondent as regards the potential results and impacts of a future insular policy which take into account the measures they proposed. Diagram S4.2.2 presents the analysis of the responses.

Graph S4.2.2: Potential results of future insular policy



An important part of the respondents (16,67%) believe that an insular policy designed on their proposals will result in the enhancement of islands' competitiveness (adoption of new technologies, attraction of skilled labor, improvement of the quality of services, easy access to other economies and goods and exploitation of the competitive advantages of insular economies). In addition 4,17% expects the emergence of local economies while 6,94% support that such an insular policy will result in the improvement of islands' attraction.

A percentage of 11,1% supported that a potential result could be the further improvement of transport infrastructures and consequently the improvement of connectivity and mobility. Another 13,9% believed that proposed measures could create the appropriate conditions for the sustainable development of islands. Almost 11% of total respondents' expect the development of tourism sector.

A conclusion from the above analysis is that local authorities are proposing policy measures on different topics scoping to address the different attractiveness parameters.

The implementation of a different strategy for the islands requires nevertheless the appropriate policy adaptations at all levels: European, national and regional/ local. In this context, based on the subsidiarity principle of the EU, a set of relevant European policy

options may form a European policy framework to support the European islands to tackle their specific situation by responding to the problems arising from their permanent natural or demographic handicaps (i.e. insularity), as well as to utilize the opportunities emanating from their rich natural and anthropogenic environment and cultural heritage. **The aim of this European policy framework should be to improve the attractiveness of the islands, give them the opportunity to equivalently compete within the European single market and finally ensure the sustainability of their development.**

Such a policy framework should be based on the following principles:

- **Respect of the provisions of the Lisbon Treaty** and mainly Article 174 referring to "*... regions which suffer from severe and permanent natural or demographic handicaps such as the northernmost regions with very low population density and islands, cross-border and mountain regions*". This calls for the acceptance of the unfavourable consequences that islands face due to their natural characteristics, and the development of a European policy framework to encounter them. Such a framework should take into account that permanent natural handicaps need permanent interventions. Moreover the article 175 asks the Member States and the EU to coordinate their policies for the implementation of the internal market in order to achieve the specific goals of the article 174; more specifically the EU has to assist the achievement of these goals through the Structural Funds and to report on that.
- **Provision of equivalent opportunities** to the European islanders for certain crucial services and infrastructure (e.g. equivalent accessibility to transport, capital, energy, communication, technology, etc). This argument is also supported by the Commission's Communication on "A single market for 21st century Europe". In this communication the Commission states under its operational principle: "Ensuring equal treatment and promoting universal access" that: "*Territories with a geographical or natural handicap such as outermost regions, islands, mountains, sparsely populated areas and external borders, often face challenges in terms of access to services of general interest, due to the remoteness from major markets or the increased cost for connection. These specific needs must be taken into account*". The recognition of this need by the European Commission calls for relevant support measures dealing with the impacts deriving from these handicaps which are identified as inhibitory for the sustainable development of the islands. More specifically the

article 170 of the Lisbon Treaty underlines the need for a connexion of the island regions to the European networks of transport, telecommunications and energy in order to be able to profit from the European internal market without any boundaries.

- **Respect of the Proportionality principle.** The proportionality principle which is fundamental for the European legislation and policies should be applied each time EU plans/ implements policies with significant territorial impact.

It should be considered that the cost for the implementation of a European policy tends to be bigger in the case of an insular/ isolated area, due to their permanent natural/ demographic handicaps and their impacts (e.g. accessibility problems, limited market, etc). For this purpose, when it comes to create infrastructure or to provide goods and services in such areas, an assessment of the additional cost incurred for the citizens and enterprises of these areas is required.

In order for an EU policy to be able to achieve its objectives equally in all the EU regions, the additional cost needed for its implementation in the islands (due to their permanent natural handicaps) should be taken into account.

Moreover, the policy implementation regulations should be more flexible and adapt to the scale of the territory concerned (the small scale of the islands) to achieve the optimum impact.

- **Promotion of the endogenous development** of the islands based on the exploitation of their particular assets while keeping balance between the three components of sustainable development (environment, society –including culture-, economy).

In addition to the above principles, a policy framework for the European islands should respect the differences among islands arising from the different intensity with which the insularity characteristics act on the attractiveness and the overall performance (as expressed by the State Index) of the European islands. Therefore, the intensity of the policy options, as well as the intensity of the funds to be applied, should be adjusted to the intensity of insularity.

An example worth referring to is the interrelation between different sizes (in terms of population) of the islands -as one of the insularity characteristics- and policy measures. According to DG REGIO (see Annex VI, p.19) *"...the size of the population and hence of the local market is a major determinant of the development challenges faced by a given territory and the diversity of situations is likely to be much more limited within each subgroups of islands"*. This implies that the smaller the island (in terms of inhabitants), the lesser the possibilities for reaching agglomeration economies and economies of scale<sup>65</sup> and more intensive the required policy measures (e.g. services of General Interest) to encounter insularity.

As an initial basis for the differentiation among islands according to the intensity of insularity the classification of the European islands presented in the current analysis could be used.

An additional parameter that "hides" the intensity of insularity in some islands and has also to be considered on the adjustment of the policy options is the intraregional inequalities occurring in cases of archipelagos/ island complexes ("double insularity") as well as in cases of islands belonging to a continental mainland region, where the reality differs from island to island, or island to mainland respectively although belonging to the same region. For these cases a specific care is needed in order to reveal the intra-regional disparities among the different islands of an archipelago before applying the policy measures. This requires an additional statistical effort in order to collect or produce data at the island level, because the data at the level of administrative unit (NUTS 2 or 3) might not be representative for all the islands.

Forming a policy framework for the European islands is now imperative, as EU is in a phase of initiating its Strategy for the next decade (EUROPE 2020), reconsidering its Cohesion Policy in order to include territoriality and generally reforming its budget strategy. Some indications of this new era are given in Barca's Report, e.g. by proposing Strategy, Place Based Territorial Perspective, Focus on Priorities, Monitoring System based on indicators, debate on Results concerning the Well-Being of populations. Therefore, it would be useful to examine how specific territories (like islands) **could obtain a different treatment by addressing their attractiveness concerns (priorities) within the "new" European policies in order to be able to fulfil their sustainability goals (islanders' well-being); Policies and Financial Instruments should be adapted to the territorial needs.** It is useful to remind the definition of the European Court of Justice

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<sup>65</sup> Enterprises in bigger islands have more opportunities (bigger local market, better accessibility) than small ones.



which considers that, a discrimination “... consists in treating similar situations differently, and different situations similarly” (Finding of the Court of First Instance –fourth chamber-, 26 October 1993. *Wagner Ruling Cases T-6/92 and T-52/92*). Arguing that, as the functioning of the Internal Market requires common rules, it discriminates the islands where the freedom of movement of persons and goods is relative and the principles of competition are skewed.

Within this context and on the basis of the previously quoted principles, the European policy framework could take into account the specific situation of islands within three main axes:

**A. Possible changes in European Governance Adaptation and better coordination of European policies**, especially among the ones that have a strong territorial impact, in order to take into account islands’ specific characteristics and potentialities.

**A1. Design and implementation of integrated multi-sectoral and multi-fund programmes** and interventions at the island level, with the goal to achieve the highest value impact for the territory, increasing its attractiveness for both residence and entrepreneurship. A coherent island’s development framework that aligns sectoral and local priorities, objectives and approaches, recognizing the realities of these territories as well as their endogenous potential, both at the design and the implementation stage, creates complementarity and synergies among the different European policies and brings together local, regional and national levels of governance.

The 5<sup>th</sup> Report on Economic, Social and Territorial Cohesion “argues that an efficient Europe 2020 strategy requires close coordination between Cohesion Policy and other EU policies. In many domains, public policies have a grater overall impact if they are closely coordinated rather than being implemented in isolation. Recent work by the OECD suggests that it is important to combine investment in transport infrastructure with support for business and human capital development to achieve sustainable economic and social development” (EU, 2010, p.24).

Moreover the TIPTAP project advocates that “the integrated, multidimensional nature of the sustainability concept provides a rationale for an integrated approach to territorial cohesion policies. But other elements push in the same direction, namely: a) the fragmentation of decision of decision making powers.... ; b) the evidence of growing problems and concerns in specific territorial contexts, witch call for complex, multidimensional interventions:

metropolitan development, coastal development..." (TIPTAP, 2009, part 3, p.12).

**A2. The Impact Assessment (IA)** that should be launched for every EU policy and program has to comprise "islands" as a specific category of territory<sup>66</sup>. The impact of the European and the national policies on the attractiveness of the islands should be recorded at the design phase recognizing their natural characteristics as constant factors affecting their development in a severe way. Therefore the adaptation of the policies to the specific islands' development conditions is necessary to ensure that the policies are relevant to the islands' needs, potential and opportunities.

**A3.** The creation by the Commission of the **Inter-Service Group** on Territorial Cohesion comprising of representatives of various Directorate General has to be considered as a substantial step towards the coordination of European policies and the consideration of the particular situation of the different types of European territories (urban, rural, mountainous, insular etc). It is also necessary for the regional and local representatives to actively participate at the design of policies that correspond to the situation of their territory and be held accountable for their effective implementation. Therefore capacity building is important for the sustainability of any developmental intervention at the regional and local level. Improving the governance procedures and extenuating the administrative ones of the European projects is necessary in order to permit small insular enterprises and local authorities<sup>67</sup> to take advantage of them.

**A4.** A more **complete system of criteria**, using as a base the State and the Attractiveness Indexes, should complement the use of GDP per capita as the indicator used for determining regions eligibility and policy intensity for financing by the EU Cohesion Policy. It is important not only to recognise the special situation of the islands as well as of other territories with specific problems due to low attractiveness and the extent of the problems that they face when designing European policies but also to monitor and assess the implementation of these policies in the territory. **A complete set of statistical indicators that reflect the real situation of the island territories needs to be further developed and monitored.** The attractiveness criteria used in this study have a clear territorial dimension and could form the basis to depict the

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<sup>66</sup> It has to be underlined that the analysis in TIPTAP project does not take into account the different types of EU territories.

<sup>67</sup> The local authorities of small islands (mainly in the case of archipelagos) rarely participate in European projects and the impact of European projects run by regional authorities is generally inexistent or insignificant.

territorial diversity of the EU. Furthermore the eligibility rules included in the (Cohesion Policy) regulations should apply in the case of island territories in such a way that provides full range eligibility of actions included in the Islands' Strategy and not only the restricted number of actions based on "a list of thematic priorities linked to the priorities, Integrated Guidelines and flagship initiatives of Europe 2020" (5<sup>th</sup> Cohesion report p.14) as designed mainly for the European mainland.

**B. Possible adaptation of some European Sectoral Policies with an explicit spatial dimension** in order to take into account the specific characteristics of islands.

**B.1. Transport Policy**

As accessibility is a crucial parameter in order to ameliorate the attractiveness of an area, the TEN-T has to be a real multi-modal policy and to be applied also in islands. The creation of maritime and air corridors between the European mainland and the islands by financing the fix and the mobile infrastructures can contribute to this direction. Diminishing the transportation cost of goods and persons by applying of the territorial continuity principle is a complementary measure for increasing accessibility.

Even if the EU Regulation No 3577/92 applying the principle of freedom to provide services to maritime transport within member states imposing the Public Service Obligations or the Public Service Contracts on islands routes may be considered as a good example on how EU law and policy, it can be adapted to islands conditions; there is room for improvement as problems of seasonality combined with low demand –mainly in small islands-, quasi-monopolies situations, the application of public service in international routes etc have to be addressed.

**B.2. Energy Policy**

A combination of the "Energy-efficient Europe" and the "Green High Tech" scenarios has to be adopted (ESPON 2010, p.96-98). There is a need for a long term planning taking into account the long run trends, the changes affecting the energy sector but also the islands' specificities.

- The first goal has to be a more "energy-efficient islands" leading to a decrease of the per capita consumption. This is important because: (a) producing energy on islands will be always more expensive than on mainland and as it has to phase the rather low but intensively seasonal demand and (b) islands have to participate in the reduction of CO2 emissions target. This goal

could be achieved by developing programs for public and private buildings, local companies – building sector could be boosted in this way without “consuming” more of the limited space of islands. The use of electric cars can be promoted mainly in the smaller islands where the distances to cover are very short.

- The second goal refers to the development of technology on renewable energy: developing new industries around green energy sources such as wind power, tidal power, solar power and biomass have to take into account the scale of the islands and the fact that natural and cultural landscapes and biodiversity are nowadays the most important assets that islands possess.
- A third goal, the connection of islands to the European mainland’s network could be examined as a complementary target in order to ensure secure supply of energy at affordable prices within an effective system.

### **B.3. Environmental Policy**

Considering that on islands: (a) the environmental resources as water, land, wetlands are limited and valuable and (b) they are their main comparative advantage in order to form the basis for high added value, competitive “qualitative and green islands” an integrated approach should be adopted in order to achieve the sustainable use of the fragile natural assets for the fulfilment of the local population needs.

**The adaptation of the Environmental priorities** in order to take into account the specific needs of small and isolated populations within a rich but fragile environment; reducing the use and increasing the reuse of scarce resources such as water, land, energy through an integrated approach. Diminution of energy consumption is more crucial and compatible with the “quality islands” option but less economic efficient solution than the development of renewable energy systems (disproportionate to the scale of the islands’ wind mills).

Mitigation of the climate change impacts have also to be addressed as sea level rise and change of rainfall patterns are expected..

All these interventions have as prerequisite new knowledge adapted to the islands’ small scale: incineration systems for solid waste treatment and waste water treatment installations developed for urban areas are not suitable for small populations. Furthermore, different organisation systems have to be applied for recycling in islands in order to diminish the transport cost between islands or between islands and the mainland. Mitigation of the climate change impacts have also to be addressed

#### **B.4. Rural Development Policy**

**Reinforcement of the Rural Development Policy and specifically the measures for LFAs<sup>68</sup>** in order to produce high quality and high added value food within a high quality environment and landscape; supporting pluri-activity, innovation, lifelong learning, networking (intra- or inter- island between different activities in order to increase the market) and local governance (on the island level) is a prerequisite in order to produce “sustainable” structural changes within the local production system. **A restriction of the LFA’s concept to Specific Territories with permanent natural handicaps has to be adopted in order to concentrate the financial effort.** The local Governance on the island level has to be reinforced and extended<sup>69</sup> based on Leader’s initiative positive experience.

#### **B5. State aid**

The Treaty on the functioning of the EU (article 107, 3,c) allows aid to be used to facilitate the development of certain areas where it does not significantly affect competition (“category c” regions). In this category are included areas with a GDP per head below the EU-25 average, those with unemployment over 15% higher than the national average or those with major structural changes as well as regions with permanent obstacles (islands with a population of 5000 or less, regions with low population density etc); this means that an island of 6000 inhabitants affect competition more than a central continental area with some million inhabitants and high unemployment rate. EU has to reconsider the criteria of this “category c” in order to take into account in one hand the magnitude of population in order to respond to the criterion “affect competition” and in the other hand the attractiveness parameters of different EU regions; **such a modification would include all the EU island regions and islands within this category.** EU has also to increase the aid given to the enterprises of those areas and to modulate it accordingly to their level of attractiveness and the accumulation of characteristics as low GDP per capita, high unemployment, low population density etc.

**C. Ideas for compensation of the “insularity cost”** that islander entrepreneurs and inhabitants bear in order to acquire the same level of services and goods as European mainlanders whether

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<sup>69</sup> The Local Actions Groups created by Leader initiative comprising the principal local actors could assume the elaboration and implementation of the Rural Development Plans on the island level

referring to the construction of basic infrastructures or the provision of basic public services.

- **C1. The setting up and the operation of the General Interest Services** such as Transport (including fixed and mobile infrastructures), Communication, ICT, Health, Education, Energy, Water Management, Waste Treatment in order to secure equitable (in quality and cost) services to all islanders independently where they live (small islands are directly concerned) but also to give enterprises the possibility to operate; the “territorial continuity” principle can be used as a basis for the calculation of the insularity cost. Particular effort has to be developed in order to achieve the Europe 2020 targets for better education (diminution of early school leavers, increase the presence of young people within the post secondary education).
- **C.2 The creation and the operation of (specifically the very small) insular enterprises;** this has to cover not only the investment costs but also the need for outsourcing different services such as accounting services, marketing services, the production and the incorporation of innovation within the productive process and generally the provision of any kind of expertise necessary for the development of competitive activities. State Regional Aids System has to “positively discriminate” small insular enterprises<sup>70</sup> especially when these are focusing on the goals of “qualitative and green islands”, incorporating innovations and qualitative employment. Moreover, State Regional Aids System has to support in a similar way self-employment mainly when it concerns the establishment in islands of scientists enriching in this way the local labour force and providing specialized services to enterprises and inhabitants. The diminution of the VAT for activities (productive processes) effectuated on the islands (external transport included) in order to compensate part of the extra operational cost is another measure that could support the small island enterprises.
- **C.3 Creation of permanent<sup>71</sup> structures, clusters and networks** in order to provide external consulting to the very small insular enterprises for R&D and innovation, management, design of new products and services, access to new capital and new markets etc, in order to tackle in a permanent way the low

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<sup>70</sup> Small enterprises have more difficulties to access finance than the bigger ones; in the case of insular enterprises the situation is even worse.

<sup>71</sup> The fact that many structures and networks have been financed on project basis from European Funds has not permitted their longevity after the accomplishment of the project; moreover, in many cases these actions were either supported or totally executed by external consultants without creating know-how locally.

penetration of innovations in the islands and address the low competitiveness of their economy. So the islands regions have to support in a permanent way this kind of investment not only to absorb and spread innovations produced elsewhere but also to produce adapted solutions for the specific problems of islands. This is kind of structures based on the use of communication systems could create virtual "agglomeration economies" and compensate a part of the isolation "penalty" of islands.

Moreover, all islands regions have to be considered as external or internal European border regions and participate in the cross-border cooperation. The current limit of 150 km imposed by article 7.1 of the Council Regulation (EC) 1083/2006, dated 11 July 2006, for the purposes of cross-border cooperation should be reviewed.

Finally a permanent network between islands' stakeholders (including Regional and Local Authorities, Chambers of Commerce and Industry, Universities<sup>72</sup>) could be a tool for the creation of a common knowledge and innovation basis need either for the application of the current report's policy recommendations or generally for dealing with insular specificities.

- **C.4 The cost of living and acquisition of services for all the inhabitants** that cannot be produced locally such as the access to hospital or university services, to cultural activities, to information, etc
- **C.5 The training and the life long learning** of employers, self-employed, employed and unemployed people adapted for small and isolated populations. The promotion of e-learning services, the financing of high level courses for small groups (the Gozo experience), the financing of specific studies, necessary for the success of local development plans, out of the island (the Sardinian experience) etc are some examples.
- **C.6 Support the traditional sectors and activities** such as fishing, farming, herding, etc. that are tightly associated to the identity and the quality of islands' lifestyle but which cannot compete with the large mainland areas.

The role of Insular Chamber of Commerce could be reinforced as intermediate bodies in order to alleviate the administrative burden of the coordination/application of these measures from national and

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<sup>72</sup> The recent creation of the Excellence Network of Island Territories (ENIT) in composed by 25 Universities from european and non-european islands could cooperate with already active inter-island bodies as Island Commission of the Conference of Peripheral Maritime Regions of EU and the Network the Insular Chambers of Commerce and Industry of EU (INSULEUR) for this purpose.

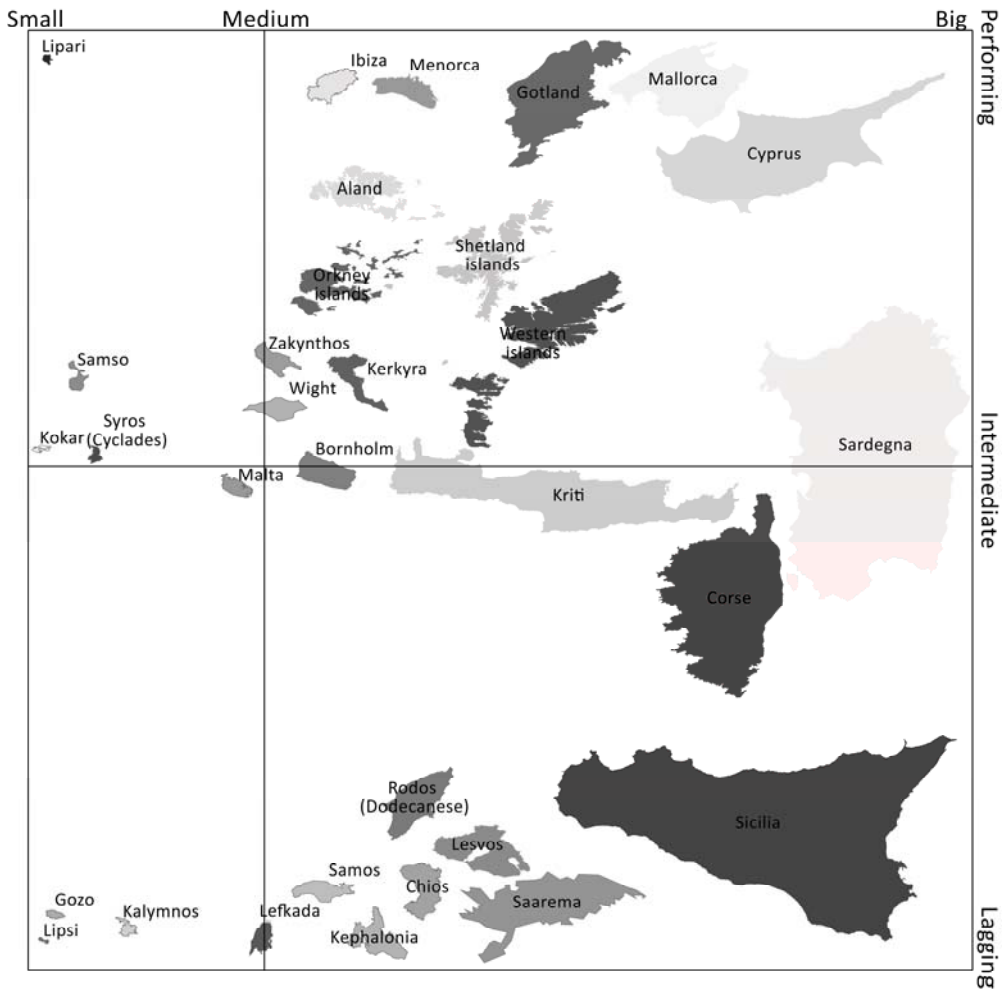
European authorities. In this way local stakeholders will have a more active participation in the definition of the strategic options but also in the implementation of endogenous and integrated territorial development approaches in order to ameliorate the effectiveness of different European and national policies.

The above policy measures have outputs that influence the different parameters of attractiveness. The proposed policy options have focused more on the necessary structural changes (i.e. entrepreneurship, human capital, R&D-innovation, SGI, protection of natural assets etc) that can have positive impacts in mid and long term on the sustainability of islands than on direct income increase that has immediate positive impact for the local population but which stops when the transfer of money stops.

This analysis clarifies that the positive discrimination demanded in EU policies for islands in order to address their permanent obstacles must differ according to inter islands disparities shown at the Figure S4.2.1. **Disparities concerning their population size, their sustainability state (where GDP and unemployment level are included) and their attractiveness have to be taken into account.**



Figure S4.2.1. Schematic presentation of islands' classification



## 5. Integrated System for Monitoring Islands

The purpose of a Monitoring System for islands is to support regular updates of the data included in the study in order to evaluate continuously the state and the attractiveness of islands and assess European policies. At the same time, islands' stakeholders can use this information for assessing their own local and regional policies. It has to be underlined once more here that a major stake for islands' analysis is the geographical level: even if the Statistical Units NUTS 2 and 3 could be considered as sufficient for a global European analysis, the LAU level is the inescapable statistical level for policy implementation and assessment.

The parameters identified during the development of the methodology: economic efficiency, social cohesion, environmental preservation, attractiveness, accessibility etc., seem to be adequate for the assessment of the situation of islands or for comparisons between islands and the EU. The initial list of variables selected for the purpose of this project was exhaustive and apparently too ambitious. The variables finally used for the analysis and the construction of the different indexes are perhaps sufficient for the present study<sup>73</sup> but has to be reconsidered if a broader and permanent monitoring system is to be established.

Based on the list of parameters used within this study, the environmental parameters and variables used by the EEA in different reports published recently and the indicators used in the 5<sup>th</sup> Cohesion report (mainly those that are EUROPE 2020 targets) we propose the following list. Such a list is under a permanent reconsideration and review as new topics become crucial and old ones lose their importance.

### A) SUSTAINABILITY PARAMETERS AND INDICATORS

Parameters	Indicators
Economic effectiveness	<ul style="list-style-type: none"> <li>➤ GDP &amp; GDP per capita evolution (PPS)</li> <li>➤ GDP per capita convergence</li> <li>➤ Structure of the economy GVA (share of competitive activities, share of principal activity)</li> <li>➤ Employment evolution</li> <li>➤ EU Human Development Index</li> </ul>
Social cohesion	<ul style="list-style-type: none"> <li>➤ Population evolution</li> <li>➤ Natural population growth</li> <li>➤ Net migration into NUTS 3 regions</li> <li>➤ Age structure / % of population +65 years</li> <li>➤ Employment rate 20-64</li> </ul>

<sup>73</sup> It is not the case for data on environmental issues but also for some social cohesion and attractiveness parameters.

	<ul style="list-style-type: none"> <li>➤ Unemployment rate (total, women, young, long term)</li> <li>➤ Population aged 15-64 born outside the EU</li> <li>➤ Net adjusted disposable income of private households (PPCS)</li> <li>➤ Population at risk of poverty after social transfers</li> <li>➤ Early school leavers</li> <li>➤ Population aged 30-34 with a tertiary education</li> <li>➤ Female life expectancy at birth</li> <li>➤ Male life expectancy at birth</li> <li>➤ Infant mortality rate</li> <li>➤ UN Human Poverty Index</li> </ul>
Environmental conservation	<ul style="list-style-type: none"> <li>➤ % of artificial land</li> <li>➤ Fresh water availability</li> <li>➤ Concentration of particulate matter (PM10) at surface level</li> <li>➤ Ozone concentration exceedances in NUTS 3 regions</li> <li>➤ Soil sealing per inhabitant</li> <li>➤ Vulnerability of NUTS 2 regions to climate change</li> </ul>

## B. ATTRACTIVENESS PARAMETERS AND VARIABLES-INDICATORS

PARAMETERS	VARIABLES - INDICATORS
Accessibility	<ul style="list-style-type: none"> <li>- Multi-modal accessibility</li> <li>- Cost of travel</li> </ul>
Public Interest Services (Energy)	<ul style="list-style-type: none"> <li>- Amelioration of infrastructure</li> <li>- Quality and Cost of services</li> <li>- Amelioration of efficiency (production and consumption)</li> <li>- % of Renewable Energy</li> </ul>
Agglomeration economies / competitiveness	<ul style="list-style-type: none"> <li>- Services to enterprises and population financed by the state/local government</li> <li>- Competitiveness incentives for business</li> <li>- Labour Productivity</li> <li>- Labour productivity in industry and services</li> <li>- Competitiveness Index</li> <li>- Private investment per head (PPS)</li> </ul>
Environmental and Cultural Heritage	<ul style="list-style-type: none"> <li>- % of Natura 2000 zones</li> <li>- % of recycled waste material</li> <li>- Urban waste water treatment capacity</li> <li>- CO2 Production</li> <li>- Cultural sites protected and exploited</li> <li>- % of employment in cultural activities</li> <li>- Creation of cultural amenities/infrastructures</li> </ul>
Feeling of Safety - Security	<ul style="list-style-type: none"> <li>- Criminality change</li> </ul>
Natural and Technical Hazards	<ul style="list-style-type: none"> <li>- Forest fire prevention and coping</li> <li>- Floods prevention</li> <li>- Pollution prevention</li> <li>- Tsunamis prevention and coping</li> </ul>
Labour qualifications	<ul style="list-style-type: none"> <li>- Educational attainment level (population 25-64)</li> <li>- Lifelong learning</li> </ul>
Information society penetration	<ul style="list-style-type: none"> <li>- Broadband connexion</li> <li>- Use of Internet</li> <li>- E-commerce</li> </ul>
Research and	<ul style="list-style-type: none"> <li>- % GDP dedicated to R&amp;D</li> </ul>

innovation	<ul style="list-style-type: none"> <li>- Existence of R&amp;D structure</li> <li>- Employment in high-technology sectors</li> <li>- Patent applications to the European Patent Office</li> <li>- Regional Innovation Performance Index</li> </ul>
Social Capital	<ul style="list-style-type: none"> <li>- Social networks</li> <li>- NGO action</li> <li>- Coping for Hazards Confrontation</li> </ul>
Governance Quality	<ul style="list-style-type: none"> <li>- Existence of Local Vision-Strategy-Plan</li> <li>- Level of participation of stakeholders in vision and strategy creation, planning and decision making</li> <li>- Existence and Performance of Structures Supporting Entrepreneurship (Development Agency, Technology and Innovation Center...)</li> <li>- Transborder / transregional cooperation projects</li> <li>- Cope with social problems (poverty, exclusion...)</li> </ul>
Employment opportunities	<ul style="list-style-type: none"> <li>- % of young unemployment change</li> <li>- % of long term unemployment change</li> <li>- % of active population change</li> <li>- % of women active population change</li> <li>- Young people aged 15-24 not in work, education or training</li> </ul>
Quality of life	<ul style="list-style-type: none"> <li>- Standardised death rate from cancer for population under 65</li> </ul>

## 6. Issues for further analytical work and research, data gaps to overcome

Three different groups of needs for further work come out from the work undertaken in this project:

**A) Concerning the implementation and the monitoring of a policy adapted to the specific characteristics and needs of the islands considered as a sub-category of Specific Territories.**

- **The non availability of data at a pertinent functional unit -that is definitely the island level-** obstructs a more analytical work as the use of NUTS 2 and NUTS 3 information (when it is available) cannot reflect the islands' reality (archipelagos, coastal islands). EUROSTAT could fill this gap by: i) adopting a "specific" territorial nomenclature and ii) using statistical techniques in order to give estimations at the island level (when it is under the NUTS 3 level).
- **The "Insularity cost"** coming out from the islands specific characteristics as "territorial dis-continuity" and small market (small population size) **has to be estimate in order to be addressed by the different EU policies** as it is influencing the investment and the operation cost of the state, the enterprises and the inhabitants making islands unattractive.
- **The use of composite Attractiveness and State Indicators instead of the per capita GDP indicator** in order to determine the regions to be covered by Cohesion Policy could address the complexity of the notion of territorial cohesion.
- **The creation of a new Multimodal Accessibility Index** in order to incorporate sea transport and to distinguish between transport of people and transport of commodities. The cost of different means of transport has also to be included in this accessibility index.

**B) Concerning the concepts and the tools used for the analysis**

- **The concept of "Territorial Cohesion" – as a recent one within the EU jargon-** has not a clear and operational definition. However the Green Paper on Territorial Cohesion

states that *"the concept of territorial cohesion builds bridges between economic effectiveness, social cohesion and ecological balance, putting sustainable development at the heart of the policy design"*. But *"This aspiration has not yet been met by a clear definition of territorial cohesion. It is still subject of ongoing discussion although much of the discussion has focused on economic and social aspects rather than the environmental dimensions of the concept"* (EEA, *The environmental dimension of environmental sustainability*, p.7). Even concepts as "economic effectiveness", "social cohesion" and "ecological balance"<sup>74</sup> or "human and environmental well-being" have not a clear definition and there is no any broader commitment about the parameters, variables and indexes describing and measuring them; there is no more commitment about the weights of these dimensions resulting to a underestimation of environmental one. In every study different sets of variables are used; so the results of the different studies are not directly comparable. **Consequently, it seems urgent to clarify the concepts and to create a basic common set of variables and indexes and to produce the corresponding data sets.**

- Other concepts such as *"Attractiveness"* and *"Equity of opportunities for all the citizens of EU"* have also to be **clarified** if they are going to continue to be part of the EU evaluation system; these concepts have a clear territorial dimension as they can explain the unequal pattern of distribution of population and activities within the European territories and what can be the sustainability goals in the different EU territories, including islands.
- Related to the above observations functional improvements have to be done at the tool for impact assessment of EU policies, the TIA. *"The fact that no common concept for TIA does in fact exist at present"*(TIPTAP, *op.cit*) don't facilitate policy evaluation. One of the main problems concern the use of variables as mentioned above. Even if the EU has already set an evaluation system of the projects during the '90s précising that every policy has outputs, results and impacts, the set of indicators used in the different studies don't follow

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<sup>74</sup> If the concept of "territorial cohesion" remains imprecise, the situation concerning the concept of "sustainable development" and its 3 dimensions (economic effectiveness, social cohesion and environmental balance -or environmental conservation-) is not much clearer.

this classification; this situation has as consequence outputs of policies (i.e creation of a Natura zone) to be considered as an impact on environmental conservation (measured by the share of artificial land into the studies area). **Consequently, a classification of the variables in order to have the necessary information for the TIA cause-effect relations has to be effectuated.**

### **C) Concerning data availability**

The lack (or the public unavailability) of pertinent data on different topics related to the analysis of the state in different areas as well as the output, the results and the impact of policies at the basic administrative units (NUTS 2 and 3) is a crucial handicap that has to be bridged in order to produce IA and TIA's of EU policies. The lack of data is more crucial concerning environmental parameters.

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