RIS3 Regional Assessment: Ioanian Islands

A report to the European Commission, Directorate General for Regional Policy, Unit I3 - Greece & Cyprus

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Smart specialisation priorities and the innovation system

The Ionian Island region is clearly heavily specialised in tourism activities and one previous innovative actions project piloted efforts to enhance quality, improve tourism businesses and develop information technology applications. Inter-connected with the tourism sector is the bio-economy, both on terrestrial natural resources and biodiversity (with a potential for reinvigorating the agricultural sector through the production of new crops and a focus on designated origin, etc. products) as well as aquatic resources (blue-biotech). Finally, marine energy potential is still at a nascent stage (the most advanced plans in Greece are in the Aegean sea) but the future RIS3 cannot ignore efforts to reduce the islands cost basis through increased use of wind, solar and possibly tidal energy.

In terms of the innovation system, the region lacks a sufficient critical mass of businesses to warrant the development of a dedicated regional innovation agency, however, the creation of a regional innovation network could be envisaged. This would involve funding of a co-ordinator, located for instance in the regional development fund, and local (in each main island, etc.) and thematic specialists who would be paid on a performance contract basis to visit, advise and mentor regional enterprises in their innovation activities. The French regional technology development network model, as applied in the insular regions, could be a source of inspiration.

Governance and stakeholder involvement

During the last decade the Ionian Islands implemented only one project from the family of RITTS, RIS, RIS+ and PRIA: the 3I "Innovation in the Ionian Islands" (2003-2005) project focused the tourism sector and the creation of new services based on quality management and ICT usage. 3I was managed collaboratively by a Steering Committee composed on regional stakeholders from the regional government, academia, and businesses. The program was designed and implemented locally and reflected the choices and needs of the Region. A follow-up was expected in the OP 2007-2013. However, with the transfer of the OP innovation axis management to the GSRT, this continuity was lost. As the GSRT funding figures document, since 2006 no innovation policy was implemented in the Region.

At this stage the expert team recommendations, which were also presented during the stakeholders meeting in Corfu, focus on:

- Ensuring the bottom-up elaboration of the RIS3 and the strong participation of the private sector and academia along the entire planning process, from the SWOT analysis to the definition of strategic priorities, the design of R&I actions, and the selection of impact assessment indicators.
- Ensuring that an entrepreneurial discovery process will take place in the region, bringing on the surface technology needs within the dominant production complex of agriculture – local food production – gastronomy – hospitality – tourism.
- Working collaboratively with other Greek regions, which share the same characteristics (South Aegean, North Aegean) for achieving economies of scale in smart specialisation technology inputs.

Innovation policy

The 2007-2013 OP for the Ionian Islands includes the usual three priority axes, and the Digital Convergence and Entrepreneurship axis was expected to finance support actions to tourism and SMEs of 34 million Euros. However, data received from the GSRT indicates that less than 1% of funds available under the respective axis were allocated and practically no innovation policy was implemented. For the forthcoming

programming period 2014-2020, the initial strategic orientations of Ionian Islands indicate an intention to refocus the strategy around the core tourism sector with links to the agro-food, cultural heritage, etc. sectors. At this early stage of RIS3 preparation, our recommendations are the following:

- Innovation policy should focus on the major production complex of the Region, the "agro-food + gastronomy + hospitality + tourism" complex and identify technologies that can enhance its competitive advantages.
- Stakeholders from the private sector and academia have already elaborated ideas for new business opportunities in the field of bio-agriculture, food production with anti-oxidant properties, food preservation by essential oils, use of yeast-fungi in wine production, anti-oxidant olive oil, which should be further analysed and documented.
- Information technologies targeted on tourism and the environment is a promising area and can provide opportunities for regional growth. The Information Technology Department of Ionian University has elaborated innovative ideas for business creation in two niche markets (a) e-content and creative industries development, and (b) use of informatics for preventing and managing natural disasters, environmental risks, natural resources management, and promotion of tourism, which also should be taken into account.
- Sector- and technology-focused innovation policy should be combined with horizontal actions for business incubation, new product development, innovation funding, and reach to global markets.

Clusters policy

The expert team recommend that the Ionian Islands should consider developing a cluster strategy similar to that the Balearic Islands, (a specialised, connected and sophisticated regional innovation system), which has contributed to enhance the technology domains relevant for tourism. The policy is delivered through clusters of companies that develop technologies related to tourism. Hence, it is recommended to study replicate a competitive technology industrial cluster approach to facilitate the rapid spread of good practice (e.g. Balearic Islands, Corallia Clusters Initiative).

ICT policy, broadband, eServices

In addition to covering the referred topics of the RIS3 strategy regarding ICT, the region should put special emphasis on the ICT technological support of the most crucial sectors of the regional economy i.e. tourism & culture, fishing, transportation, and environmental protection.

The region should investigate viable policy tools to provide incentives for new IT-enhanced products and services from local enterprises, and also award funds for the fast transformation of traditional businesses using ICT tools.

Smart transportation and wireline/wireless broadband expansion are crucial for the competitiveness of the whole economy, mostly including the tourism industry.

The hidden growth potential of remote areas and isolated islands, within the Region, should attract special attention, since it can be exploited using affordable ICT technologies.

Particular emphasis should be placed in setting proper rules for the substantial involvement of the private sector, by assuming part of the risk of the planned investments.

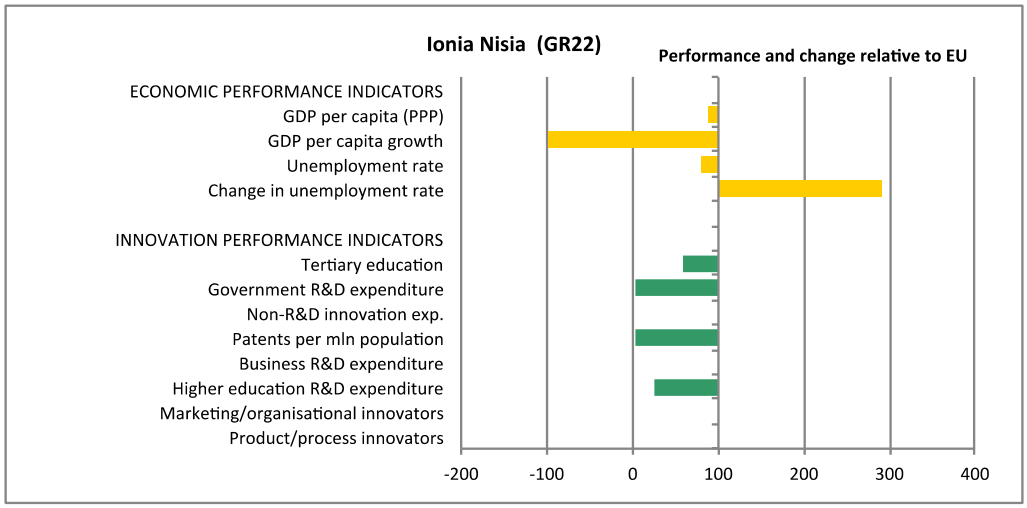
2. Regional Innovation Performance and potential

2.1 Regional profile and specialisation

The Ionian Islands region groups 32 islands covering an area of 2,307 km² on the west coast of Greece and hosts 2% of the Greek population (234,332 inhabitants in 2011)[1]. In recent decades, the islands population has fallen due to emigration and the decline of traditional industries, fishing and agriculture. In 2009, the region produced 1.8% of the national Gross Domestic Product (GDP) and GDP per capita was €19,100 (in PPS), ranking the region 6th out of 13 Greek regions. Income per head has diverged from the EU average since 2004 and stood at 81% in 2009.

The service sector accounted for 84.7% of the regional GDP in 2009, the highest share of all Greek regions, while industry and construction contributed 12.3% and the agricultural sector 2.9% (declining over the past decade, see Appendix D). As highlighted by the Regional Innovation Monitor (RIM, 2012), the tourism sector and trade dominate the regional economy and all the other services in the region gravitate around these dominant sectors offering complementary services. SMEs are the backbone of the regional economy but cater mainly for local needs and are thus not linked to national or international value chains, hindering their technological modernisation, competitiveness and growth prospects.

Figure 1 Summary benchmark of regional innovation performance



Source: Regional Innovation Monitor, data used is 2011 or latest available year. Trend data is over latest three year period for which data is available.

Like the rest of the country, the region is hard hit by the economic crisis, both in terms of economic activity and employment. Most tourist firms, hotels and related businesses have seen their activity fall a result of decreased demand due to falling incomes and higher taxation. Unemployment rose to 14.2% in 2011 from 8.5% in 2008 and in the construction sector, hit by a drop-off in both public and private investments, unemployment in some of the islands exceeds 75%.

The level of education of the workforce is relatively low with 16.9% of the population aged 25-64 having tertiary education in 2011 (25.4% in Greece, 26.8% in EU27), which ranks the Ionian Islands in penultimate place amongst the Greek regions. Moreover,

[1] All data provided is sourced from Eurostat unless stated differently.

like the rest of Greece, there is a low level of life-long learning with only 2.2% of adults aged 25-64 participating in education and training in 2010 (Greece 3%; EU27 9.1%).

The Ionian Islands is one of the least dynamic Greek regions in terms of research and development (R&D) and innovation activities. In 2005, regional gross expenditure on R&D (GERD) was only €5.9m, 0.4% of the national total or 0.13% of regional GDP (compared to the Greek average of 0.6% or the EU27 average of 1.83%). The vast majority of regional R&D investment occurs in the higher education sector (€5.2m, i.e. 89% of GERD compared to an average of 47.5% in Greece and 22.5% in the EU27) and in the government sector (8.8%, 20.3% in Greece, 13.6% in the EU27). However, this was equivalent to a total investment of only €0.5m.

Even more striking is the fact that regional firms invested only €139k in R&D (2.4% of the total GERD, compared to 31% nationally or 63% for the EU27), an insignificant share of regional GDP. In addition, since 2008 and the crisis, the reduced liquidity of the private sector, in combination with limited funding provided by the banking sector for private investment will have further reduced business R&D activity. Not surprisingly, given the low business R&D investments, the level of patenting activities, is very negligible: 4.42 patents registered (2007) per million inhabitants to the European Patent Office from the Ionian Islands (8.04 in Greece, 111.58 for the EU27).

More positively, while still well below Greek and EU27 averages, the share of Human Resources in Science and Technology (HRST) increased from 17.5% of the regional workforce[2] in 2000 to 22.4% in 2011 (or 1.4% of the Greek HRST). Again in absolute numbers, the capacity is limited with only 149 full-time equivalent (FTE) R&D personnel (2005) or 0.15% of the region's active population (0.69% in Greece, 0.95% in the EU27). Only two FTE were active in the business sector against 142 in the higher education sector and six in the government sector. Looking specifically at the share of researchers (0.1% of active population against 0.4% in Greece and 0.59% in EU27), all but one of the 99 regional FTE researchers was in the higher education sector. This low concentration of knowledge workers creates a significant disadvantage for a transformation of the region towards a 'knowledge economy'.

Although created in 1984, the Ionian University only published a first scientific article in 2002 and is active in natural sciences and social sciences. Since then the scientific output has increased but the performance is still well below other Greek universities with 16 publications in 2010 or a total of 63 publications from 2006-2010[3], leading to 22 citations, ranking the university rank second to last and with the lowest citation impact[4], (0.22 over the same period). The Technical Education Institute of the Ionian Islands (TEII), created in 2003, is active in medical sciences and natural sciences, but it ranks last out of the Greek TEI in terms of publications (28) and second to last in terms of citations (82) from 2006-2010. Given the low level of scientific activity, it is impossible to identify a scientific specialisation for the Ionian Islands.

The relative industrial specialist, compared to other European regions[5], suggests that the Ionian islands are most specialised in the manufacture of tanks, reservoirs and metal containers and the manufacture of central heating radiators and boilers; the maintenance and repair of motor vehicles; sea and coastal water transport; and the renting (repair) of personal and household goods (see Appendix E). Needless to say, travel agencies and tour operators and tourist assistance are a regional specialisation.

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[2] This indicator gives the percentage of the total labour force in the age group 15-74, that is classified as HRST, i.e. having either successfully completed an education at the third level or is employed in an occupation where such an education is normally required.

[3] http://metrics.ekt.gr/en/report02/index

[4] The relative number of citations to publications of a university compared to the world average

[5] The minimum degree of specialisation is 1.5 (meaning that the region has 50% more employment in the industry than the size of the region), and the industry must have at least 500 employees in the region (in order to eliminate high specialisations in very narrow industries).

However, during the stakeholder meeting, the continued fragmentation of the tourism sector, inter-island competition and lack of facilities (e.g. for cruise ships) were underlined as barriers to a more specialised and high-value added tourism.

Considering the overall innovation performance of the region, the European Regional Innovation Scoreboard[6] ranks the Ionian Islands (grouped in the mega-region Kentriki Ellada) as a modest-medium innovator (the lowest of four performance categories) along with all other Greek regions aside from Attica. Similarly, the 2011 Regional Innovation Monitor (RIM) annual report classified the region amongst a group of knowledge absorbing innovating regions (again along with all other Greek regions except Attica). From a positive perspective, this group of 19 EU27 regions has the highest average score (amongst the RIM regional grouping) on 'innovative entrepreneurship' (based on the share of SMEs that declare to have introduced innovations in the Community Innovation Survey) but the lowest score on 'technological innovation': business R&D and patenting is very low, while the non-R&D innovation expenditures (as a % of turnover) are higher than in any other group. This implies that innovation is mostly through integrating knowledge created elsewhere by purchasing 'off-the-shelf' technologies.

Figure 2: SWOT of regional innovation potential and specialisation

Strengths	Weaknesses
• Economic specialisation in specific manufacturing activities in addition to tourism activities • High-quality of life and biodiversity • Existing university with limited capacity but several laboratories carrying out research in informatics and historical and cultural heritage	• Low level of R&D and quasi inexistent business R&D investment • Economy based on small low-tech companies • Insular region with related cost, etc. disadvantages • Low level of ICT diffusion • Low level of education of the population and life-long learning practices • No apparent scientific specialisation in fields relevant for regional economy • Lack of innovation culture within firms
Opportunities	**Threats**
• Capture greater share of high-value added tourism (e.g. eco-/agro- tourism, expand capacity of cruise ships), etc • Enhance innovation in services, notably through better ICT diffusion • Improved support to upgrading of SMEs technological capacity • Potential for increasing renewable energy sources (off-shore wind, etc.) • Re-development of agro-food sector and exploitation of bio-diversity for natural products, including blue biotech potential	• Economic specialisation in low-tech sectors • Fragmented tourism offer, with inter-island competition • Competition from low-cost economies

Finally, it was striking that there was little discussion, during the stakeholder meeting, about the (sustainable) exploitation of the maritime environment around the islands, either for 'traditional' activities such as aquaculture or emerging opportunities such as blue-biotech (marine organisms)[7], or marine renewable energy (essentially offshore wind, where research on the potential off the Ionian islands has already been

[6] MERIT & Technopolis 2012, http://ec.europa.eu/enterprise/policies/innovation/files/ris-2012_en.pdf

[7] In line with the European Strategy for Marine and Maritime Research which identifies blue biotechnology as one of the key enabling technologies and maritime economic sectors.

undertaken[8] but where national grid interconnection and tariffs policies would require careful co-ordination of regional and national initiatives)

Recommendation: the region is clearly heavily specialised in tourism activities and one previous innovative actions project (see section **Error! Reference source not found.**) piloted efforts to enhance quality, improve tourism businesses and develop information technology applications. Inter-connected with the tourism sector is the bio-economy, both on terrestrial natural resources and biodiversity (with a potential for reinvigorating the agricultural sector through the production of new crops and a focus on designated origin, etc. products) as well as aquatic resources (blue-biotech). Finally, marine energy potential is still at a nascent stage (the most advanced plans in Greece are in the Aegean sea) but the future RIS3 cannot ignore efforts to reduce the islands cost basis through increased use of wind, solar and possibly tidal energy.

2.2 The strengths and weaknesses of the regional innovation system

As already evident, the regional innovation system in the Ionian Islands is one of the weakest in Greece in terms of business R&D and innovation, higher education research and also in terms of the active intermediaries (see Appendix B). As noted above, the limited scale and breadth of activities of the regional university makes it difficult to identify scientific potential that could be exploited economically. However, while surprisingly there is no department focused on tourism studies, a number of university departments do work, more or less directly, on topics of relevance for cultural heritage and hence indirectly high-value added tourism. These include the laboratories within the music studies, history and archives departments. The Informatics Department has elaborated innovative ideas in two niche markets (a) e-content and creative industries development, such as 3D animation, interactive environments, e-content management, 3D sound, virtual reality in video games, and (b) use of informatics for preventing and managing natural disasters, environmental risks, natural resources management, and promotion of tourism.

At the present time, the intermediary structures operating in the region are only standard 'generalists', such as the chambers of commerce, which offer little value added expertise to enterprises in innovation or technology related matters.

Recommendation: the region lacks a sufficient critical mass of businesses to warrant the development of a dedicated regional innovation agency, however, the creation of a regional innovation network could be envisaged. This would involve funding of a co-ordinator, located for instance in the regional development fund, and local (per main island) and thematic specialists who would be paid on a performance contract basis to visit, advise and mentor regional enterprises in their innovation activities. The French regional technology development network model could be used as a source of inspiration[9].

3. Stakeholder involvement and governance of research and innovation policies

In the last decade the Ionian Islands were involved in only one collaborative innovation project from the RITTS, RIS, RIS+ and RPIA family: 3I – Innovation in the Ionian Islands (2003-2005). The 3I project focused on the tourism sector and the

[8] D. Karamanis, C. Tsabaris, K. Stamoulis, D. Georgopoulos, Wind energy resources in the Ionian Sea, Renewable Energy, Volume 36, Issue 2, February 2011, Pages 815-822, (http://www.sciencedirect.com/science/article/pii/S0960148110003629)

[9] http://www.oseo.fr/nos_partenaires/recherche_innovation_et_technologie/reseau_de_developpement_technologique_rdt

creation of new services based on quality management and ICT applications. The main objectives were: (1) blend digital services with traditional services of tourism, (2) improve existing businesses, (3) create new services and innovative start-ups in tourism, culture and agricultural sectors, (4) empower regional actors for environmental risk management decision-making, (4) provide regional support for innovative actions, and (5) transfer of best practices from other Greek and EU regions.

Figure 3: 3I regional programme of innovative actions - main actions

1. IONIAN ISLANDS QUALITY IN TOURISM
1.1 Creation of a regional quality standard and certification for 300 local enterprises from an accredited institution of certification.
1.2 Benchmarking of 50 companies in the tourism sector and provision of guidelines for business improvement.

2. INNOVATIVE START-UPS IN TOURISM
2.1 Business and financial support for new forms of tourism, cultural, religious, athletic, congress.

3. DIGITAL IONIAN ISLANDS
3.1 Telematic applications under the portal of Digital Ionian Islands.

4. INTELLIGENT REGIONAL RISK MANAGEMENT
4.1 Information-based risk management of forest fires: real-time decision support system.

5. INNOVATIVE KNOWLEDGE MANAGEMENT
5.1 Centre for innovation management and dissemination of good practices.
5.2 Digital innovative commercial services in the "old city" of Corfu.

Source: http://thaleia.westgate.gr/3i/index.php?lang=0

An example of the outcome of the 3I project was the digital Corfu portal (see Figure 4). 3I was designed and implemented locally and reflected the choices, needs, and orientations of the most important regional stakeholders. The project was overseen by a steering committee composed of the General Secretariat of the Region of Ionian Islands, the Management Authority for the ROP, the Regional Development Fund, the Centre of Telematics of Western Greece, the Computer Technology Institute CTI, Aristotle University of Thessaloniki, the chambers of commerce and industry of Ionian islands, and the Tourism Organisation of Ionian islands ETIN. A follow-up was expected under the Digital Convergence and Entrepreneurship Axis of the ROP 2007-2013. However, this hoped for continuity was lost with the transfer of funding for innovation projects to the centrally managed programme run by the GSRT.

Figure 4: Virtual tour of the historic centre of Corfu

Source: http://www.digitalcorfu.com/default.aspx?lang=en

In order to start preparing a RIS3, the Intermediary Managing Authority (IMA) of the Ionian Islands organised a meeting on 15 October 2012 with the participation of the Regional Authority, stakeholders from the private sector and academia, and the DG REGIO expert team. The discussion focused on the RIS3 principles, the concept of smart specialisation, the regional economy and perspectives for improvement during 2014-2020. The sectors offering competitive advantages identified were agriculture, local food production, gastronomy, hospitality and tourism. The participants strongly supported a bottom-up elaboration of the RIS3 since it offers an opportunity for the design and implementation of R&I policy targeted on the real regional needs.

At this early stage of RIS3 elaboration, the expert team **recommendations**, which were also presented during the stakeholders meeting, are:

- Ensuring the bottom-up elaboration of the RIS3 and the strong participation of the private sector and academia along the entire planning process, from the SWOT analysis to definition of strategic priorities, the design of R&I actions, and the selection of impact assessment indicators.
- An entrepreneurial discovery process should be fostered in the region, bringing on the surface technology needs within the dominant regional business sectors: agriculture, local food production, gastronomy, hospitality, and tourism.
- Working collaboratively with other Greek regions, which share the same characteristics (South Aegean, North Aegean), could offer economies of scale in smart specialisation technology inputs.
- Ensure that there is a full integration of Structural Funds by developing a RIS3 strategy that encompasses ERDF, ESF as well as the agricultural sector (EAFRD) and fisheries and aquaculture (EMFF).

4. Towards a regional smart specialisation strategy

4.1 Regional research and innovation policies

As noted above, the regional research and innovation performance is extremely low, with the Ionian Islands ranked last amongst the Greek Regions; while participation in the Information Society is still relatively limited, despite the progress made in recent years. During the last decade, tourism became the dominant form of tertiary activity and the region has a prominent position in the Greek tourism market, attracting 7% of arrivals, 10% of nights, and hosting 12% of hotel beds nationally. In this context, the Ionian Islands OP for 2007-2013 included, as was the case for all Greek ROP, three priorities (Figure 5) including one on Digital Convergence and Entrepreneurship, with a strong focus on tourism (Figure 6) and a stated intention to implement the RPIA.

Figure 5 Priorities and funding of OP Ionian Islands 2007-2013

Priority axis	Total funding EU + national	%
1. Infrastructure and accessibility	67.476.500	19.72
2. Digital convergence and entrepreneurship	34.352.747	10.04
3. Sustainable development and quality of life	240.288.500	70.24
TOTAL	342.117.747	100

Figure 6: Current regional priorities for research and innovation

Policy Documents	Priorities and objectives
Operational Programme of Ionian Islands 2007-13 (2007)	The main objective of the Competiveness and Digital Convergence priority is to enrich the overall tourism product, particularly with new options tailored to local identity and specificity, which can provide the necessary flexibility, diversification and recognition, second and complementary continued efforts

Επιχειρησιακό Πρόγραμμα Περιφέρειας Ιονίων Νήσων 2007-2013 (2007)	for upgrading and modernising of existing activities. The specific objectives included: • Support of business by promoting specific forms of tourism, the qualitative upgrade of services, and the adoption of quality standards • Support of businesses to introduce new technologies, encourage the absorption of innovative practices and ideas • Support to the modernisation of existing activities in tourism, services including trade, and processing. • Promotion of innovative projects and practices stemming from the Regional Innovative Actions Programme implemented during 2000-2006. • Promotion of new integrated pilot projects on strengthening regional identity and sustainable development.

However, the IMA ceded the ROP budget for innovation to the GSRT, under the precondition that an equal amount of money was returned to the region for funding RTDI actions through GSRT programmes. According to data received from the GSRT (see Appendix C), funding for RTDI projects during the period 2007-13 is extremely limited, at just over half a million euro (or 1% of the funds initially available under the Digital convergence and entrepreneurship priority of the ROP). In practice, there has been no significant investment in regional innovation policy since 2007.

Given these findings, the expert team **recommends** that:

- Innovation policy should focus on the major production complex of the Region, the "agro-food + gastronomy + hospitality + tourism" complex and identify technologies that can enhance regional competitive advantages. Innovation polity should target on the creation of technology and competence centres that achieve critical mass of these technologies and make them available to local SMEs. Analysing the AGHT complex and identification of main activities is the first step toward this goal.
- Stakeholders from the private sector and academia have already elaborated ideas for new business opportunities in the field of bio-agriculture, food production with anti-oxidant properties, food preservation by essential oils, use of yeast-fungi in wine production, anti-oxidant olive oil. These initiatives should be further analysed and documented. Information technologies targeted on tourism and the environment is also a promising area and can provide opportunities for regional growth.
- Sector- and technology-focused innovation policy should be combined with horizontal actions for business incubation, new product development, innovation funding and reach to global markets. Such policy measures can be assessed with respect to criteria of sustainability after the funding period; creation of local capabilities; promotion of integrated solutions to technology-production-market-funding; achieve private leverage; and clear contribution to development goals.

4.2 Cluster policies

The sectors in the Ionian Islands with the highest combined scores in size[10], specialisation[11] and focus[12], according to the Cluster Observatory Star Rating System are Tourism & Hospitality, Farming and Animal Husbandry (2 stars) and Transportation & Logistics, Maritime, Agricultural Products, Construction (1 star). There is not a mature (3 star) cluster on the Ionian Islands, although the tourism & hospitality sector is a dynamic organic cluster around which other emerging sectors could be linked by appropriate cluster policies. Figure 7 provides hints for the identification of opportunities at the interface between Tourism & Hospitality and other clusters and the deployment of cross-clustering policies. As this analysis is based on data available up to 2009, the Region should update with more recent data wherever possible to base the RIS3 strategy on good foundations.

Figure 7: Mature and Emerging Clusters in the Ionian Islands

Mature Clusters:
None. The Department of Audio & Visual Arts of the Ionian University is, however, a member of the microelectronics-based systems and applications cluster (mi-Cluster, www.mi-Cluster.gr).

Emerging Clusters:
Tourism & Hospitality (activities of travel agencies and tour operators; tourist assistance activities, hotels, restaurants, building completion, recreational activities, retail sale of food, beverages, renting and repair of household goods, museums and other cultural activities, eco-tourism), *Farming & Animal Husbandry* (fishing, fish farming and related service activities, growing of crops combined with farming of animals (mixed farming), farming of animals), *Transportation & Logistics* (sea and coastal water transport, scheduled air transport, maintenance and repair of motor vehicles, retail sale of automotive fuel), *Agriculture* (growing of crops; market gardening; horticulture), *Construction* (site preparation, construction material), Food & Beverages.

In short, the Ionian Islands region has no previous experience in **cluster policies**, no cluster "culture" and no mature clusters operating. However in the initial strategy for 2014-20 (adopted on 30th September 2012 by the Regional Council in response to the Ministry of Development guidelines), the region makes a clear statement on the specialisation of the region and the specific actions it will take towards the development of these sectors. In particular, competitiveness priorities will be centred around qualitative improvement of tourist business potential, linked to strengthening agriculture and manufacturing (with an emphasis on local and organic products and regional "baskets"; promoting innovative business which link tourism with culture, etc. The strategy is very similar to the cluster policy of the Balearic Islands, (a specialised, connected and sophisticated regional innovation system). Figure 8 presents the paradigm used in the Balearic Islands and the policies based on RDI that have contributed to enhance the technology domains relevant for tourism. The policy

[10] The 'size' measure shows whether a cluster is in the top 10% of all clusters in Europe within the same cluster category in terms of the number of employees. If employment reaches a sufficient share of total European employment, it is more likely that meaningful economic effects of clusters will be present. Those in the top 10% receive one star.

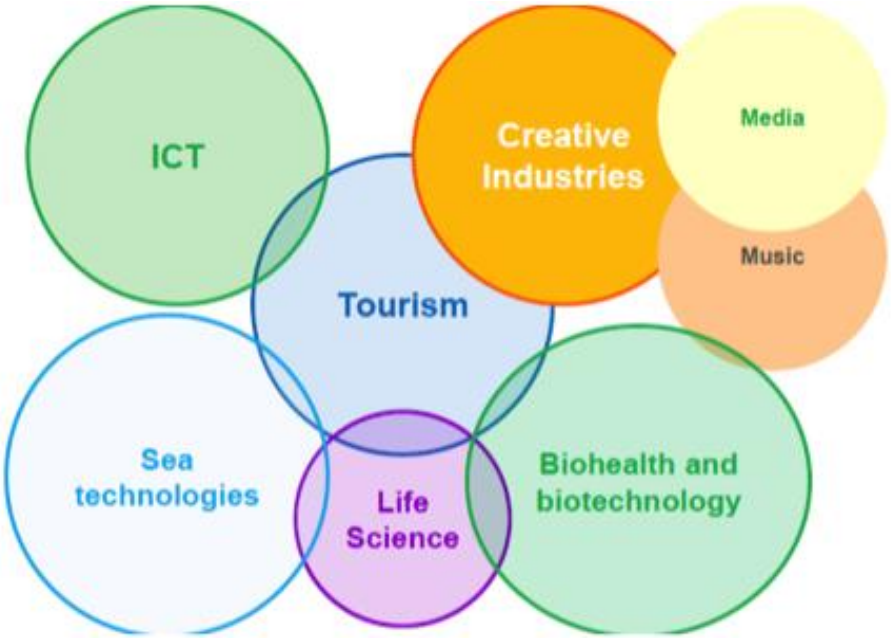
[11] The 'specialisation' measure compares the proportion of employment in a cluster category in a region over the total employment in the same region, to the proportion of total European employment in that cluster category over total European employment. If a region is more specialised in a specific cluster category than the overall economy across all regions, this is likely to be an indication that the economic effects of the regional cluster have been strong enough to attract related economic activity from other regions to this location, and that spill-overs and linkages will be stronger. If a cluster category in a region has a specialisation quotient of 2 or more it receives a star. If a cluster category in a region has a specialisation quotient of 2 or more it receives a star.

[12] The 'focus' measure shows the extent to which the regional economy is focused upon the industries comprising the cluster category. This measure relates employment in the cluster to total employment in the region. If a cluster accounts for a larger share of a region's overall employment, it is more likely that spill-over effects and linkages will actually occur instead of being drowned in the economic interaction of other parts of the regional economy. The top 10% of clusters which account for the largest proportion of their region's total employment receive a star.

is delivered through clusters of companies that develop technologies related to tourism. Hence, it is **recommended** to study replicate a competitive technology industrial cluster approach to facilitate the rapid spread of good practice (e.g. Balearic Islands, Corallia Clusters Initiative).

Figure 8: Technologies and clusters supporting tourism in the Balearic Islands

Source: Smart Specialisation Strategy in the Balearic Islands



Furthermore, to move beyond the figures that are available for comparison, more qualitative focus studies should be carried out in the activity domains where the region shows relative specialisation to identify niches. This involves expert work on **value chain analysis**. It also involves an analysis of the linkages between clusters/ industries/sectors, in order to examine whether one can talk about related variety across the areas of regional specialisation. Due to the fact that Tourism is the most significant sector the needs and requirements have to be initially collected, from the main actors in this sector, that is: tour operators, travel agencies, accommodation, vehicle hire, marine transport, land transport, air transport, airports, ports and marinas, sailing, restaurants, etc.

An emphasis should be given to facilitating **cross-clustering** and the identification of innovation opportunities at the interface between different clusters (e.g. incorporate ICT in priority sectors to increase competitiveness). Specific funding measures and support should be developed aimed at primary and secondary sector innovation and inter-linkages with tourism (for the primary sector to produce differentiated products and for the secondary to connect the primary sector with tourism).

A particular focus should be given to strengthening the cooperation of existing/emerging sectors/clusters to make **connections to local, national and global value chains**. In this respect and due to the fact that the Region is insular and has water borders with Italy and Albania and other Greek Regions, the strategy should consider incentives for the development of inter-regional clusters.

If cluster policies become a key tool for regional development, there will be a need to create a **cluster secretariat** in the region or support one at national level.

In the Ionian Islands during the 2007-13 period only a few projects were implemented in the areas of technology transfer, improvement of cooperation networks between small businesses (SMEs), assistance for R&D, in particular for SMEs and support services for firms and groups of firms. Entrepreneurial and innovation support services (like one-stop-shops) have been created in the past (e.g. Investor Reception

Centres, etc), notably through Structural Fund projects. However, despite the efforts of such intermediaries, collaboration between the small number of innovation actors remains limited. It is recommended to create a **one-stop-shop** within existing structures or a new structure for potential investors/SME start-ups with the appropriate improvements and sustainability plans based on lessons learnt and known deficiencies of current implementations.

As can be seen in Appendix B, only one industrial zone and no science parks nor incubators have been established in the Ionian Islands to date. It is recommended to provide incentives for the establishment of an **incubator** in combination with other policies like clusters that will allow the hosting and growth of selected firms that will complement the tourism & hospitality (the main sources of income in the Region). Furthermore, it is recommended to support the linkage of regional firms to Greek **business angel networks** and co-investment funds that meet professional standards, to ensure such firms can access the required capital.

4.3 Digital economy and ICT policies

Regarding broadband availability and Internet use, the Ionian Islands perform poorly. According to the "Internet Users in Greece" survey (March 2010)[13] of the Observatory for Digital Greece[14], the share of the population using PCs was 41.6% and only 37% the Internet. These figures clearly indicate that ICT penetration is still limited, yet the region hosts a huge number of tourists from developed countries each year.

The most notable ICT projects that have been implemented in the recent years were concerned with the archiving of historical archives, e-booking applications for the tourism industry, a system for physical disaster prevention, and the implementation of metropolitan access optical networks (MAN). The Region has a small number of ICT companies, mainly focused on system integration, maintenance, and software support for state agencies and for the hotel and retail industry. This shortfall causes a significant outflow of ICT professionals, as the relevant jobs are limited. The two higher education institutions are currently the main poles for retaining experienced ICT professionals and producing young scientists with adequate ICT background.

Although there is no detailed regional ICT strategy in the draft regional strategy[15], the following sectors are best suited to benefit from modern ICT tools and technologies:

Tourism and Culture: entrepreneurs, content administrators and tourists should be empowered in order to enhance the value and the impact of this industry. The involved SMEs should be motivated to exploit modern technology and synergies to maximize the outreach of the Ionian Islands, extend the tourist season, minimise management and advertising costs, and thus create more and better jobs. Special emphasis should be placed in deploying virtual reality and mobile apps.

E-government and learning: The insular nature of the region means that the cost of dealing with the regional public services is enormous for citizens and enterprises. Properly designed and interoperable e-government apps would contribute towards efficiency and transparency. The services could be easily combined with e-learning applications, to overcome the double insularity of the region.

Fishing: as a potential contributor to sustainable growth, with export potential, it is crucial to adopt modern ICT tools in the various production/distribution stages (real-time monitoring and control, logistics, e-commerce, procurement, etc).

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[13] Ταυτότητα χρηστών internet στην Ελλάδα", Παρατηρητήριο για την ΚτΠ, Μάρτιος 2010. http://www.observatory.gr/files/meletes/A100526_%CE%A0%CF%81%CE%BF%CF%86%CE%AF%CE%BB%20%CF%87%CF%81%CE%B7%CF%83%CF%84%CF%8E%CE%BD%20internet%202010.pdf

[14] See: http://www.observatory.gr

[15] "Κείμενο θέσεων για τις κατευθύνσεις εθνικής αναπτυξιακής στρατηγικής 2014-2020", Περιφέρεια Ιονίων Νήσων, Σεπτέμβριος 2012.

Transportation: transportation costs for citizens and businesses on the islands is significant. Smart transportation approaches should be deployed to minimise travel costs, reduce fossil fuel consumption and improve the business efficiency.

Environment: protecting natural resources is a key component of a viable regional development given the tourist market. ICT tools should be used by the relevant agencies to meet their goals, at a competitive cost.

Broadband Internet: the availability of affordable broadband connections for all households is a European target. The Region should complement the related national- and EU-level actions, to further extend broadband. Possible actions may be the set-up of public free-access hot-spots in several tourist sites, in ports, schools, sports/recreation areas, churches, etc. The Region can also investigate ways to improve the utilisation of existing MANs and provide proper incentives for the expansion of next generation cellular networks (e.g. LTE) in the Region.

Furthermore, the Region should seek to encourage a substantial private sector involvement in the full project cycle and risk sharing. This can be best carried out by flexible PPPs, or by ICT vouchers for selected households or SMEs. Regarding other specific RIS3 Strategy ICT-related requirements:

- There is no master plan for e-government services since most (cadastre, e-prescription, e-invoicing, etc) are administered by national authorities. However, e-services like local taxation or regional permits may be administered regionally. All e-government services should adhere to well-defined interoperability standards, and be based on dependable cloud computing platforms[16].
- There is no reference to plans for the deployment of new and the extension of existing NGA networks.
- An operational inventory of ICT infrastructure should be created.
- Active involvement of the private sector in ICT activities has to be addressed by the Region, in a way to both leverage community funding and improve sustainability, especially for the delivery of products and services.

5. Monitoring and evaluation

Monitoring refers to the need of verifying the state of implementation of activities. Evaluation refers to assessing whether and how strategic goals are met. In order to perform evaluation, it is essential that objectives are clearly defined in a RIS3 in measurable terms. A central task during the design phase of the RIS3 is to identify a limited set of results indicators and to establish target values for them.

The capabilities for monitoring, evaluation and analysis of innovation programmes and performance should be further solidified and embedded in both the new regional government structures and the wider partnership. A specific budget line could be set aside for a partnership based regional innovation observatory that could fund studies and doctoral/post-graduate research into innovation practice in regional firms, etc.

Guidance on evaluation methodologies for innovation measures is already available for the 2014-20 period[17] and the IMA, regional authorities, etc. should make themselves aware of and use such materials to develop an evaluation plan. At a minimum, one official should be specifically tasked with setting up an evaluation and monitoring system for innovation measures in the IMA.

[16] http://ec.europa.eu/information_society/activities/cloudcomputing/docs/com/com_cloud.pdf

[17] See: http://bit.ly/Igzx5T

Appendix A Key documents and reference materials

Υπουργείο Ανάπτυξης, Ανταγωνιστικότητας και Ναυτιλίας (2012) 1η Εγκύκλιος Σχεδιασμού και Κατάρτισης Αναπτυξιακού Προγραμματισμού 2014-2020 (1st Directive for Setting the Development Programme 2014-2020)

ΓΓΕΤ (2012) Πρόταση ΓΓΕΤ για τη Διαμόρφωση Κατευθύνσεων Αναπτυξιακής Στρατηγικής 2014-2020 (Proposal of GSRT for Defining Directions of Development Strategy 2014-2020)

ΕΣΠΑ (2007) Επιχειρησιακό Πρόγραμμα Ιονίων Νήσων 2007-2013 (Operational Programme of Ionian Islands 2007-2013), Αθήνα 2007.

Region of Ionian Islands (2003) Innovation in Ionian Islands Program (3I), Regional Programme of Innovative Actions funded by DR Regio. Online, http://thaleia.westgate.gr/3i/index.php?lang=0

Regional Innovation Monitor (2012), http://www.rim-europa.eu/index.cfm?q=p.baseline&r=GR22

Eurostat data accessed on 5th December 2012, http://epp.eurostat.ec.europa.eu

Bezirtzoglou C. (Editor) (2006), Islands of Innovation - Innovative Actions, Published by ISTOS, Regional Programme of Innovative Actions, Region of South Aegean

MERIT, Technopolis (2012), Regional Innovation Scoreboard 2012, Report for the European Commission, DG Enterprise and Industry, available here: http://ec.europa.eu/enterprise/policies/innovation/files/ris-2012_en.pdf

Appendix B Key actors in the regional innovation system

Leading Businesses:

GLD, Kefalonia Fisheries, Tehniki Pliroforiki, Ionian Kalk, etc.

Key Research Actors:

The Ionian University, based in Corfu and the Technological Educational Institute of the Ionian Islands with departments in Zante, Cephalonia and Lefkada.

Financing: None

Incubators, Industrial Areas/Zones/Parks

Industrial Zone of Cephalonia

Principal Intermediaries:

Chamber of Commerce & Industry of Zante, Corfu, Cephalonia & Ithaka, Lefkada, Development Agency of the Ionian Islands, Cephalonia and Ithaka, Zante, Hoteliers Association of Corfu, Cephalonia & Ithaka, Zante, Lefkada, Investor Reception Centre, etc.

Appendix C Regional RTDI funding under the OP Competitiveness and Innovation

Region	Enterprises	Research organisations	Other entities	Grand Total	% share
Attiki	€ 78,383,203	€ 33,291,462	€ 480,411	€ 112,155,076	47.4%
Central Macedonia	€ 22,588,727	€ 13,566,039	€ 38,300	€ 36,193,066	15.2%
Western Greece	€ 22,841,816	€ 8,901,221	€ 7,000	€ 31,750,037	13.4%
Crete	€ 3,623,524	€ 13,728,214	€ -	€ 17,351,738	7.2%
Sterea Ellada	€ 9,388,903	€ 1,397,119	€ -	€ 10,786,022	4.6%
East Macedonia & Thrace	€ 5,886,928	€ 1,864,884	€ 25,090	€ 7,776,902	3.3%
Thessaly	€ 4,648,471	€ 2,134,643	€ 253,000	€ 7,036,114	3.0%
Epirus	€ 2,403,100	€ 1,887,252	€ -	€ 4,290,352	1.8%
Peloponnese	€ 3,382,986	€ 545,200	€ -	€ 3,928,186	1.7%
Βορείου Αιγαίου	€ 1,813,280	€ 425,506	€ -	€ 2,238,786	0.9%
West Macedonia	€ 1,355,665	€ 524,695	€ -	€ 1,880,360	0.8%
Ionian Islands	€ 388,000	€ 120,000	€ -	€ 508,000	0.2%
Νοτίου Αιγαίου	€ 476,000	€ -	€ 18,750	€ 494,750	0.2%
Grand Total	€ 157,180,603	€ 78,386,235	€ 822,551	€ 236,389,389	100%
	66.5%	33.2%	0.3%		

Source: data received from the GRST on 10 October 2012. Calculations authors.

Appendix D Total Gross value added at basic prices – Ionian Islands

% of Total Gross value added at basic prices	2005	2006	2007	2008	2009
A - Agriculture, forestry and fishing	4.64	3.38	3.26	2.48	2.91
B-E - Industry (except construction)	3.73	4.24	3.78	3.71	4.40
C - Manufacturing	2.47	2.76	2.52	2.24	2.64
F - Construction	8.83	10.95	9.30	7.80	7.96
G-I - Wholesale and retail trade, transport, accommodation and food service activities	49.28	48.14	50.72	52.23	47.36
J - Information and communication	1.41	1.41	1.46	1.27	1.38
K - Financial and insurance activities	2.16	2.27	2.05	1.96	2.32
L - Real estate activities	8.84	8.71	9.08	9.87	11.01
M_N - Professional, scientific and technical activities; administrative and support service activities	3.02	3.23	2.95	2.94	3.45
O-Q - Public administration, defence, education, human health and social work activities	13.99	13.02	12.82	13.46	14.92
R-U - Arts, entertainment and recreation; other service activities; activities of household & extra-territorial organisations and bodies	4.09	4.65	4.56	4.27	4.28
TOTAL - All NACE activities - in Millions of Euros	**3,422.4**	**3,503.6**	**3,776.8**	**3,922.5**	**3,683.5**

Source: Eurostat

Appendix E Relative regional specialisation in 20 industries in the Ionian Islands

	Industry	Rank in Europe	Specialisation	Employment
1	Manufacture of tanks, reservoirs and containers of metal; manufacture of central heating radiators & boilers	1	7.66	550
2	Maintenance and repair of motor vehicles	1	2.34	1 884
3	Sea and coastal water transport	1	22.92	2 054
4	Renting of personal and household goods n.e.c.	1	11.35	775
5	Retail sale of automotive fuel	2	2.85	669
6	Repair of personal and household goods	2	4.92	551
7	Activities of travel agencies and tour operators; tourist assistance activities n.e.c.	2	5.26	1 335
8	Hotels	3	7.59	6 934
9	Retail sale of food, beverages and tobacco in specialized stores	5	2.99	2 636
10	Restaurants	5	2.30	4 320
11	Other recreational activities	5	2.75	620
12	Fishing, fish farming and related service activities	7	14.03	978
13	Site preparation	8	4.20	1 062
14	Scheduled air transport	9	4.69	701
15	Building completion	11	1.94	2 259
16	Growing of crops; market gardening; horticulture	15	6.93	9 476
17	Growing of crops combined with farming of animals (mixed farming)	16	1.60	2 108
18	Sewage and refuse disposal, sanitation and similar activities	21	1.73	746
19	Farming of animals	24	2.78	1 201

Source: Smart specialisation in Europe: European specialisation data by region Centre for Strategy and Competitiveness, Stockholm School of Economics, April 2011