

## ★ SUMMARY



# SCIENCE, TECHNOLOGY AND INNOVATION PLAN 2009-2012

## BALEARIC ISLANDS GOVERNMENT Ministry of Innovation, Internal Affairs & Justice



# SCIENCE, TECHNOLOGY AND INNOVATION PLAN 2009-2012

BALEARIC ISLANDS GOVERNMENT Ministry of Innovation, Internal Affairs & Justice The Plan for Science, Technology and Innovation of the Balearic Islands 2009-2012 was approved by the Interdepartmental Commission of Science and Technology on December 22<sup>nd</sup> 2008 and by the "Consell de Govern de les Illes Balears" on February 20<sup>th</sup> 2009.

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#### Octubre de 2005

#### ANSIETAT

On cal cercar la resposta al desig? A la natura que fa créixer harmoniosament la magnòlia quan ja ha perdut les flors blanques, o al món dels homes? A l'argila o a la vanitat? Però el clam únic creix dedins. I no s'estronca mai l'ànsia de conèixer, malgrat que ens neguin el fons per a la investigació. Què sap una colla de buròcrates estults com movem les mans i les idees! Una dia clar amb humitat propera al 100% ens fa vacil·lar, però no hi ha cap dubte. Sempre hi ha un més enllà.

> À mon seul désiR Àngel Terrón Homar Professor Titular de Química Inorgànica Universitat de les Illes Balears





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# Introduction



Introduction

## 1. INTRODUCTION

Since years the game rules of the global economy are changing dramatically. For the Balearic economy as well as for the entire developed world, this change of paradigm supposes challenges to be addressed as well as opportunities to be exploited.

At the bottom of all these changes is the assumption of the economic value of knowledge, which has exceeded the attributed value to traditional economic resources. Nowadays, the differentiation of a productivity chain process is achieved if their competitiveness is based on the intelligent use of knowledge, which is probably even more necessary for traditional industry sectors in developed countries. This argument is directly applicable to the model of economic activity in the Balearic Islands, which until recently has shown its effectiveness by reaching levels that exceeded the average well-being of many European regions. Actual signs of slowdown show that existing competitive advantages that have been valid until now are not able to differentiate the Balearic offer from other emerging regions.

In this process of change, the Balearic economy, which turned directly from the primary to the tertiary sector, does not have the necessity to address costly and painful processes of readjusting its productive structure, facing only to the task, certainly not an easy one, to identify the appropriate knowledge and make it useful to investigate their new competitiveness. This is the reason for the new Science, Technology and Innovation Plan for the Balearic Islands.

The main economic activity of the Balearic Islands, Tourism, should benefit from the knowledge that must be one of the main objectives of this Plan. For such reason, the Plan must be capable of stimulating the creation of the kind of knowledge that the sector needs and leading its application to all its agents, whether private or public. It is, in short, that on the one hand, tourism offer will be every day of a better quality, attracting customers with greater purchasing power, capability of advancing within the off season and sustainability orientated. On the other hand, it is about knowledge allowing an input with lower costs, products and services to a new selective clientele more and more demanding. In such provision, the traditional industry has a special responsibility, allowing it only to survive if, relying again on the knowledge can provide other benefits at reasonable costs.

This does not mean that a greater level of knowledge amongst population will lead to the appearance of new firms or even new sectors in areas of high added value, which in any case should not be forgotten in this Plan.

The Plan also must take into account that within the creation and use of knowledge through the process called Innovation, a range of agents are involved to be addressed in a specific way and that, moreover, do not act isolated. All of them are part of the Innovation system, which interact in many different ways that can encourage innovative processes. In addition, if their

interaction is not adequate, can inhibit or make them less efficient. Policies to promote Science and Innovation concentrated in this Plan should be designed to take into account the nature of the Science and Innovation Balearic system. A system that essentially must be harmoniously integrated in the broader background of Innovation systems in which is inevitably involved, the Spanish and the Balearic.

Balearic Administration, after consecutive R, D & i plans 2001-2004 and 2005-2008, had accumulated an experience that should allow the integration of appropriate monitoring mechanisms and to enhance collaboration and coordination of the different competences that compose it in the Innovation framework. Thus, the next Plan for Science, Technology and Innovation is divided into five axis: Talent Management, Research, Innovation, Transfer of Knowledge, and Governance and Social Capital.

The key is, without a doubt, talent management, an essential ingredient in any society that seeks to base its competitiveness and prosperity in the knowledge. To promote, attract and retain talent in the Balearic Islands, the Plan would include, for example, training programs, both researchers and entrepreneurs, programs that encourage young people to explore personal careers and business projects based on knowledge, or integration programs of these people with talent, whether they are from the region or outsiders, in Balearic research centres and enterprises.

The axis of research, which concentrates the programs which are aimed to stimulate the generation of knowledge and, the axis of innovation, which will promote the effective conversion of this knowledge into wealth and well-being, logically they are connected through a series of programs aimed at the transfer of this knowledge.

At the axis of Research calls will be concentrated, on the one hand, to strengthen science and technology infrastructure and equipment, R & D competitive projects and emerging research areas and, on the other hand, those designed to assess the research carried out in public centres. This will turn in with coordination programs and forecasted assistance under programs of national and international levels. An indicator of success of such programs should be the increase of R & D expenditure on to closer levels to those that correspond to the weight of the Balearic Islands within the national economy.

In the axis of innovation gather, not surprisingly, programs to support innovative projects in companies and markets based on technology, in which the petitioner can show their needs and those offering the potential for technological business that can provide the know-how they have created. Furthermore, specific development programs will be created for support to the conception of clusters with the purpose of moving towards the articulation of an innovative business trade capable of a cultural change that occurs in greater value towards innovation.



Introduction

The essential connection between creation of knowledge and innovation is established through the axis of transfer of knowledge. Its programs are aimed to strengthening existing infrastructures and the units of mediation and transfer, and to encourage mutual understanding between creators and appliers of knowledge and to articulate meeting points, measures designed to streamline processing of business creation and protection of intellectual property and training programs. All of it is made with the aim of raising the technological level of the business. One important type of activities in this area is focused on creating new and innovative enterprises based on technology, both those arising spin-off enterprises and those appearing from the departments of the public system.

At the base, also as a lubricant that permeates the whole structure and facilitates its operation, the axis of social capital and governance aims mainly to facilitate relations between the different actors of the Balearic science and innovation system. For this reason, the review of the institutional architecture of the Balearic science and innovation system and the law of science will also be taken into account.

Speaking of governance refers to a set of abstract rules, a sort of "rule of the game" that determine the actors, procedures and legitimate means of the collective action. In addition, they provide an institutional framework, a structure on which a consensus has been established, which provides security, constitutes a guarantee for the community and is based on the interaction between governments and social actors. The fact that society has a good provision of social actors, institutions and habits of cooperation (Social Capital), facilitate good governance and the dynamic process starting from the social change.

In one area, the different social actors interact, coordinate with common goals and form a social network that constitutes the Social Capital. This is the social capital that determines the joint action and to some extent establishes its Governance. In this sense, Governance is a form of coordination of economical and social dynamics of a territory, which is distinguished by the involvement and participation of numerous actors. Opposes an interventionist conception by a centralized power and gives greater status to the social actors, enterprises, intermediate institutions and the different Administrations that integrate territorial management.

Create an Economic and Social Council (ESC) of the Balearic Islands is a prototypical example of this trend towards the model of Governance, given that it is configured as independent advisory body that pronounces to civil organised society. The Government is obliged to consult the legislative initiatives in economic and social matters, which gives the society the opportunity to participate in the formation of the general will. It is especially important to note that this participation is mandatory and occurs in an institutional framework, meaning that it was subject to a series of rules and controls and has turned into its own solemnity. Therefore, goes far beyond the declaration of intentions or voluntary consultation to citizens on initiatives that affect them and is, ultimately, within a framework of interrelated network in which governmental and non-

governmental agents participate to make collective decisions based on consensus.

In this sense, it is important to introduce Governance and Social Capital in the Science, Technology and Innovation Plan, as the ESC has the suitable structure for conducting a debate and a study to operate and capture with accuracy the mentioned Governance and Social Capital of the Plan.

Therefore, thanks to the collaboration agreement between the Ministry of Economy, Finance and Innovation and the Economic and Social Council (ESC), signed on December 3<sup>th</sup> 2007, began a collaboration that resulted in the organization of four seminars in which the participation of experts and social and economic actors, starting to produce a document for conclusions. The theme of the seminars was: (1) Business Angels and entrepreneurship, (2) University R & D and public policy, (3) Social capital, Governance and territory, and (4) Information, Trust, Cooperation and Innovation in social networks.

All this was intended to design an ambitious Plan for Science, Technology and Innovation but at the same time realistic, based on existing strengths in our region and taking into account, to the possible extent, the opportunities offered by the Innovation systems both national and European in which we are immersed. A Plan with a clear ambition to achieve a better communication of the Balearic structured society with reference to knowledge, with the confidence that only by using knowledge we will maintain and raise the level of well-being that we enjoy right now.



Introduction





Science, Technology and Innovation Plan 2009-2012



## 2. SCIENCE, TECHNOLOGY AND INNOVATION PLAN 2009-2012

This chapter begins with a formal presentation to the beneficiaries of this Plan. As follows there are the objectives pursued and once presenting the logical divisions and thematic areas of impact, priorities and axis of activity that structure this S, T & I Plan.

Below are the programs and measures for each of the activity axis, each of which has a certain budget, as well as governance mechanisms of this Plan.

#### 2.1. S, T & I TARGET PLAN (2009-2012)

To know the content of this Plan, more specifically, may be of interest to:

- Society in general, as the recipient of assets and services made available through the innovation of the companies and as recipient, in the end, of its success productivity chain process, foundation of the progress in social well-being and quality of life and also all that relates to the integration of sustainability in all its actions.

- All those who generate knowledge and carry out technological and non technological developments: UIB, IPO, technology centres, research units of the private sector...

- R, D & I system intermediaries: interface units for transfer of knowledge and input for knowledge-intensive firms.

- The technology-based industry sector (ICT, audiovisual, nautical ...) and to all businesses based in the Balearic Islands which belong to intensive sectors based on knowledge and traditional sectors that are prepared to introduce innovations in their business models or processes of production and marketing.





S, T & i Plan recipients (2009-2012) are, after all, members and institutions of scientific and technological communities and businesses that live and / or working in the Balearic archipelago, in addition to all the citizenship who live on a temporary or full time in the Balearic Islands.

From the point of view of the Government, it should be communicated to society in general and actors of the Science & Innovation System of the Balearic Islands (SISBI) in particular, our effort of investing as soon as possible in R & D in the appropriate place depending on the level of GDP. We should also point out to the productivity chain process, the importance of having an effective system and the effort which is involved. To the sector of public research and development, it must be expressed the need to orientate their work towards those demanded areas by the productivity environment and, ultimately, by the internal and external consumer market of the Balearic Islands.



Figure 1. Science, Technology & Innovation Plan objectives.

To gain strategic copetitiveness in local and international socioeconomical environments.

2

To improve productivity in search for excellence and competitiveness to generate knowledge that could impact in innovation.



To increase players from the Science & Innovation System of the Balearic Islands, its capability, commitment and trust.

4

To obtain a local and global visibility of the efforts and results obtained in Science & Innovation, to the point of crediting the Balearic community and to promote scientific and innovative culture.

#### 2.2. OBJECTIVES, SCOPE AND PRIORITIES OF THE PLAN

The S, T & I Plan (2009-2012) should become the essential reference tool to allow investment in science and innovation and to build and coordinate a system of science and innovation agile and competitive, generating new knowledge, as a backbone of R & D + i system and as a platform that can contribute meaningfully to build a knowledge society that creates wealth, employment and well-being.

#### 2.2.1. Objectives

The Balearic Islands Government is committed to the Plan for Science, Technology and Innovation (2009-2012) to help achieving four complimentary objectives, very dependent on each other:

- **Objective 1:** To gain competitiveness in enterprises and sectors of local and international socio-economic strategy. These economic sectors are based on inner-sector business contributions of consolidated companies and new businesses beyond the traditional boundaries between sectors of economic activity that are more or less mature.

- **Objective 2:** Improve the productivity of the priority research areas, to generate internationally competitive essential knowledge and also applied knowledge that affect to the demanded innovations (business models, products and production systems and marketing processes, marketing and distribution) of local and global markets.

- **Objective 3:** Achieve a critical mass, increase their skills and commitment of the Science & Innovation System of the Balearic Islands (SISBI) agents for productive exchanges occurring between them that should become so-cially useful. Increase, particularly the mechanisms that form part of the financial system's science and innovation.

- **Objective 4:** Obtain a local and global visibility of the efforts and achievements, to the extent of cherishing the Balearic Islands community and to promote scientific and innovation culture among students, government and citizens.



#### 2.2.2. Areas of impact

If proposed objectives are taken as a starting point, the Plan for Science, Technology and Innovation of the Balearic Islands (2009-2012) forecasts an effect in seven different areas, which correspond to the seven types of determined agents identified in the "Map of Agents" of the Balearic Islands Science and Innovation System. It will be recalled as follows:



Figure 2. Areas of impact for the Science, Technology and Innovation Plan

- The **science bodies**, since for its role in generating knowledge, are essential. University policies on research and those related to the innovation catch, without doubt, an essential role in this area of impact of the new S, T & I Plan.

- Public and private entities for **transfer** of knowledge and technology, as well as those supporting the establishment of enterprises, represent a second key area of impact in this Plan.

- Profitable and non-profitable entities that provide **advanced technology services** to businesses should also be recognized and reflected in this Plan.

- Innovation requires public and private **capital**. Aware of this priority, the Balearic Islands Government also directs this Plan to entities committed to investment and funding of science and innovation.

- According to their way of transferring innovation to the market, companies are also an area of great significance. It could defend the preferential orientation of the S, T & I Plan (2009-2012) to the consolidated companies, knowledge-intensive and more innovative in the Balearic Islands, which are essential as a driving force in the innovation system.



#### Figure 3. Business segmentation

The Balearic Islands Government is looking at this business segment, and even more so when is placed in key sectors of the economy of this territory, but without forgetting the need to guide public efforts to the bulk of the business chain, which still concentrates important challenges in innovation. The S, T & I Plan also considers of importance to point out in new enterprises, especially if they were born to global markets.

- **Citizens**, all civic organizations in the Balearic Islands, the under-graduated educational system and, finally, the media, are another area of involvement that the Government of the Balearic Islands has identified and discriminated.

- The **innovation system** itself sets the last frame of action that should be planned. In this sense, forecast actions to continuously improve must anticipate to the forms of organization, leadership and monitoring and evaluation of the Science & Innovation System of the Balearic Islands.

In other words, through the action plan scheduled for the coming years, the Balearic Islands Government estimate embracing on each of the agents that contribute to raise the level of science and innovation in this community to achieve the four goals listed above.



#### 2.2.3. Priorities

Focus should be used to mark the policies and efforts in research and innovation, in order to be considered structured elements and useful tools for progress and well-being. The countries most advanced in this field have focused their efforts on research and innovation in a few areas, but always strategic for its regional interests. Thus, prioritizing involves selecting, from where there are known and recognized markedly different capacities and opportunities, areas where they can and want to have a relevant position or lead.



#### Figure 4. Areas of impact and its relationship with the agents of the system of science and innovation

Taking into account the research priorities, the plan emphasizes excellence and competitiveness in science.

Taking into account socioeconomic and environmental criteria, this Plan determines the relevance that productive sectors have that contribute most to the VAB and occupation to the Balearic Islands: this are the called Key Activity Markets. In addition, during the next period and according to more political-strategic criteria, it is necessary to consider the so-called Strategic Activity Markets.



It is important to appreciate the driving effect that activity markets must have that have been selected for the S, T & I Plan (2009-2012), in the sense that logical coherence articulate in the different areas of intervention of the Plan: in the policies aimed to companies of any of the five predefined types, transfer and research, but also on the program components that affect the institutions of advanced services and financing.

Market activities that guide the action lines and financing of the S, T & I Plan are:

		Hospitality		
		Air and maritime transportation + logistics		
Territe to all the Mandacate		Nautical trade		
Iourist activity Markets		Complementary activities (travel agents, car rental)		
		Leisure trade		
	TIC	Cultural sector (cultural heritage and audiovisual)		
A still the Markets related to taxing		Environmental and energy		
Activity Markets related to tourism		Food and agriculture		
		Bio-technology		
Other strategic activity markets		Bio medics and health's science		
		Culture and society		

Table 1. Productivity Markets of priority interest and strategic markets.

Thus, the first line of priority S, T & I Plan is based on research, value-added services, technology and innovation activities concerning to the activities that internationally position to the Balearic Islands. These activities are the ones seeking greater prosperity to its inhabitants: these are the entertainment and cultural trades. If the aim is to find a broad sense, the origin of these activities is diverse and includes the hotel industry and complementary activities, airport transportation and logistics, land and maritime, nautical industry, leisure industry, industry of culture (cultural heritage and audiovisual), environment and energy and food and agriculture.

The other line of priorities is particularly mindful of the decisions taken at European and national level. These are converted into a frame of reference to consider and allow certain actions for alignment and of necessary complicity (biotechnology, biomedicine and health sciences, culture and society) with the information and communication technologies (ICTs) as a priority for the mainstream.

The term of existence for this Plan will be an important moment for strengthening R, D & i in health and biotechnology (especially biomedicine). In the year 2010 should come into operation the new hospital of the Balearic Islands, Son Espases, located next to the ParcBIT and this, in turn, adjacent to the University. Thus, within a few kilometres will focus: a university

hospital with more than 4000 m<sup>2</sup> for research; ParcBIT spaces dedicated to the biotechnology companies which are expected to grow in volume and number, in addition to a biomedical research institute announced; and at the University, the IUNICS in a new scientific-technological building; and very close, Fundación Caubet-Cimera.



Figure 5. Programmatic Axis



#### 2.3. PROGRAMMATIC AXIS OF THE PLAN

In the previous paragraphs of S, T & I Plan (2009-2012) have been identified the strategic milestones, objectives have been defined, reviewed the areas of incidence and concrete priorities and division markets.

The current point specifies the vertical priorities for the S, T & I Plan (2009-2012). These are the lines that make up the Programmatic Axis of action, their main lines. The Balearic Islands Government establishes that the core objectives of the S, T & I are five:

#### 2.3.1. "Talent Management" Axis

As stated above, the absorption capacity in a system of innovation is related, first, with the suitability of the various elements of the environment<sup>1</sup> and, secondly, with interactive and institutional learning. In this section the first features are analysed to, afterwards, in the 2.3.4 section, discuss their articulation and leadership.

The systemic innovation policies emphasize in the need to bet on human resources improvement to increase the absorptive capacity of the agents in the region. In this context, it is necessary to recognize and promote the work undertaken by academic institutions, research institutes, technological institutes, researchers and companies in the Balearic Islands that day after day help to increase the talent in the region and can play a decisive role if exploited this key competence in the Balearic archipelago. It is crucial to understand that this ability to absorb and innovate depends on learning. In other words, it is essential to bear in mind that S, T & I Plan should impact on the ability of enterprises, citizens, and Administration and innovation intermediaries to recognize assimilate and exploit internal and external knowledge.

Ultimately, the major programmatic objectives of this axis are:

- Increase over the next four years the number of people engaged to research activity in the Balearic Islands.
- Train researchers and support to research.
- Incorporate researchers of excellence.
- Attract entrepreneurs and technicians with talent.



<sup>1.</sup> Training and capability levels to develop R+D activities.

In the area dedicated to enhance human resources to strengthen research capacity, the S, T & I Plan intend to create a body inspired on the Catalan ICREA Program, to integrate researchers and to encourage and manage research. It will aim to open new lines of research, strengthen existing research groups and, finally, act as a catalyst in creating new groups, including researchers to the research and technological development.

In addition, there is continuity in the proceedings to include doctor research personnel in altogether with the actions taken by the Ministry of Science and Innovation.

- Ramón y Cajal and Juan de la Cierva Programmes of MICINN to mainstream researchers, at different levels, primarily in the public sector, with the exception of those applications to be co-financed by the institutions agreed in advance with the management body of the S, T & I Plan, and preferably in the priority areas outlined previously.

- Coordination with the Torres Quevedo program, the MICINN to incorporate doctors to the private sector, being companies, technology centres or similar entities. *Ad hoc* measures will be enabled to increase the level of attention that the business of the Balearic Islands provides to this program.

- Coordination with the Ministry of Science and Technology, to promote co-financing of the Health Research Fund (HRF) and to incorporate and enhance researchers in the Balearic Islands.

- Finally, continuing the efforts initiated in the two previous Plans for training and recruitment of researchers to the Balearic Islands research centres (pre-doctoral fellowships, technical research support, etc.).

#### 2.3.2. "Research" Axis

The first generation of innovation policies, based on a linear model of the innovation process that begins in the research lab and goes through successive stages until the new knowledge is incorporated in applications, emphasized on science and technology and acted on the offer, expected to generate its own demand.

Aware that today these policies are not enough, the Government of the Balearic Islands continues to claim that they are necessary and, therefore, through this S, T & I Plan seeks to promote increased spending on R & D supporting groups seeking excellence, competitiveness and productivity.



This programmatic Axis, like the previous one, is also aimed at strengthening the scientific foundation of the system, which has been singled out because of the importance that this Plan provides to talent management. This program has two main objectives. First, strengthening the structure of public R & D to increase their competitiveness and efficiency, in order to try to reach excellence in the many possible fields and secondly, strengthen and develop infrastructure.

Today, scientific and technological research is based on criteria of excellence, opportunity and effectiveness. Components as the minimum measures of the R & D groups, network cooperation, interdisciplinary criteria, the opening to the national and European level, among others, are critical facts to strengthen a system from a structural point of view. With the contribution of S, T & I Plan, research groups should be willing to be globally competitive and to be locally committed. For years, with such goal support to scientific excellence groups and competition is given.

Through the S, T & I Plan (2009-2012) will strengthen the identification and continued support to the competitive groups, with the criteria of minimum critical measure, of research excellence, in international competitiveness and continuity of the joint task to the components of the group. In addition, independent external evaluations will continue.

At the same time promotion to groups formed by young researchers who have recently built (emerging groups) showing projection towards excellence will be of importance.

Promotion for research in tourism will also be introduced, which can embrace<sup>2</sup> a wide range of fields: socio-demographic and entertainment trends, corporate social responsibility, perception of social impacts and benefits of the sector, communication skills related to sustainability (environmental, economic, cultural, social) of the destinations, business management and ICT, financial mechanisms for increasing private investment, adaptation to climate change and other disciplines related to the problems arising from tourism.

As far as research infrastructures are concerned, it is intended to operate the complex R + D + i at the ParcBIT, where technology colleges, mixed units and biotechnological companies, among others, will share spaces. Moreover, it is intended to promote existing spaces as well as creating new ones, depending on budgetary needs.

This Plan places special emphasis also on the applicability aspects of research and the assessment of results by the market. In this sense, it is planned to operate a new measure to encourage the enhancement of research in the Balearic Islands.



<sup>2.</sup> Taking into consideration amongst other, the Tourism Program of the R+D+i National Plan 2008-2011

The objectives sought to programmatic Axis are:

- Increasing the expenditure ratio of R & D / GDP from the actual 0.28% to the 0.5% in four years.
- Strengthening infrastructure plus scientific and technological equipment.
- Recognize the search for excellence and competitiveness as well as providing the necessary opportunities for the development of emerging groups.
- Establishing new mechanisms for research assessment.

#### 2.3.3. "Innovation" Axis

Policies that favour the push of the market and in particular SMEs, are part of the classic innovation policies. These are often structured around four mechanisms, such as: infrastructure development services to businesses, helping SMEs to access advanced services, promotion activities for services offered and finally, actions aimed at developing new business and to establish businesses in the area. The Programmatic Axis of the S, T & I Plan (2009-2012), which follows to the one that is currently being implemented, will address those policy approaches from this Plan that relate to business services.

As regards the development of new businesses, it fits into the centre of business innovation Axis. In connection with this theme, the S, T & I Plan (2009-2012) proposes the development and consolidation of business incubators based at the ParcBIT, or dependent on it. It is intended also to promote a Bio-incubator aiming to promote new biotechnological companies in a building for common services.



The objectives related to promoting entrepreneurial research and innovation go beyond those related to business creation. Therefore, they are taken into account, amongst other, the following aspects:

- Promote project accomplishment of innovation in enterprises.
- Streamline the procedures for setting up companies, patents and registration of copyrights.

- Undertake actions aimed at businesses to inform personnel about the concepts of research, development and innovation and its distinction, as well as to raise awareness of the importance of reliability when collecting statistics for a real reflection of the situation.

- Introduce innovation as a more integrated task into the company activities, which promote the introduction of innovation both in products and services as core and support processes.

- Support new financing instruments for the creation of new innovative companies or knowledge-intensive. At the same time subsidy programs will spread at national and European level.

- Enhance corporate entrepreneurship and the creation of spin-off from businesses.

- Help facilitating the use of purchasing from the public sector as an instrument that can have a double benefit: the improvement and increased efficiency of public services and fostering innovation (implementation of the new Law 30/2007).

Proven to improve the financing of the system, S, T & I Plan intends to establish a Venture Capital Company. The venture capital is a mean of economic promotion and acts as a dynamic financial system. Through participation, recruitment and promotion of investment projects, it is intended that this new mechanism will have positive effects on economic development in the Balearic Islands.



#### **Cluster Policies**

Particularly at the European level, public policies have evolved in the sense that support the creation of competitive environments, to the extent that it can be accepted as a working hypothesis that in the immediate future will be increasingly difficult to obtain funds which are not directed to support innovative activities that are not based on indirect measures of support, excluding many of the direct aid to companies.

For this reason, the Balearic Islands Government assumes that policies should affect the different agents and, especially, in their relations to prioritize the creation of linkages to improve the articulation of the system and interactive learning. This would encourage, through the S, T & I Plan the creation of new knowledge and involve goals of excellence in the short and medium term.

To do so, should be provided, essentially, measures helping firms to be more innovative and have better access to the knowledge economy. Thus, the government's strategy is to provide comprehensive support, from guidance to companies that are demanding and those to support innovation, up to generators of new knowledge and technology (universities, public research organizations, technology centres), via different agents and support and its representatives (business organizations, chambers of commerce, banks, etc.).

The regional Government wants to take a proactive role as a coacher and facilitator to enable the business to join the dynamic generation of technological innovations. Everywhere, and in the Balearic Islands, the policies of clustering of firms are a response to the challenge, that's the reason they should be included in the S, T & I Plan.



#### Table 2. Clusters in the Balearic Islands

#### **Clusters in the Balearic Islands**

Category	Employees	Size	Specialisation	Focus	Stars
Hospitality & tourism	47.180	1,29%	5,15	10,27%	***
Construction	27.687	0,42%	1,69	6,02%	*
Transport	17.860	0,29%	1,16	3,89%	*
Agriculture	4.252	0,51%	2,04	0,93%	*
Shoe industry	3.150	0,72%	2,89	0,69%	*

#### Table 3. Tourism and hospitality clusters in the EU

#### Tourism and hospitality clusters in the EU

Clusters	Employees	Size	Specialisation	Focus	Stars
Canarias (Tenerife)	82.099	2,24%	5,11	10,19%	***
Akdeniz (Antalya)	57.924	1,58%	4,50	8,96%	***
Illes Balears (Mallorca)	47.180	1,29%	5,15	10,27%	***
Ege (Izmir)	45.571	1,24%	2,41	4,81%	***
Tirol (Innsbruck)	29.486	0,80%	5,36	10,68%	***
Andalucía (Sevilla)	86.366	2,44%	1,64	3,27%	**

#### Source: Cluster performance indicators (European Observatory)

**1. Size:** the size of the cluster it is measures in terms of number of employees if, it is a 10% higher to all European cluster at the same level. Those regions over 10% receive a star.

**2. Specialization:** a region with a strong specialisation out of one determined cluster level can attract economic activity from other regions and allow further exchanges. The ratio it is calculated as:

Employed within a category in one region / Total employed in the region

Employed within other categories in Europe / Total employed in Europe

If ratio within a category in the region is above 2, a star is allocated

3. Focus: measures the employed at clusters related to the total in the region. If such relation represents over 10% receives a star.

Globalization has facilitated the flow of capital towards the most competitive and specialized regions promoting the role of clusters,<sup>3</sup> as the linking between them provides complementary activities. The regions that combine risk capital (venture capital), abilities and search for excellence with strong clusters have great opportunities to head into clusters in which innovation emerges.

Thus, the evidence reveals that innovation depends not only on the intensity of R & D, but also the environment in which apply.<sup>4</sup> Clusters promote a favourable environment to innovation, allow creating and improving ideas in collaborative networks carried out by companies and institutions, and facilitate an open innovation.<sup>5</sup> On the other hand, experience with clustering is highly contrasted.

A quick review of the latest information<sup>6</sup> on clusters in the Balearic Islands, shows the bond between clusters initiated policies and the actual situation in the Balearic archipelago.

Although the rate of innovation that the EU experts have given the cluster of tourism in the Balearic Islands is not very favourable, it is considered a very strong socio-economic environment related also to the transport cluster, also important, which has rise to nautical and aeronautical poles.

<sup>6.</sup> ENTERPRISE AND INDUSTRY REPORT (2008); Innovation Clusters in Europe: A statistical analysis and overview of current policy support.



<sup>3.</sup> Michael Porter definition of cluster is a geographical concentration of interconnected business which operates in the same field of economy, share specialised suppliers and associated services and have common strategic goals.

<sup>4.</sup> The latest European Union conference on Innovation and Clusters, held in Sweden in January 2008, allowed to thoroughly review the policies on innovation and clusters, and their interrelationships, in different European countries. It also allowed us to know very interesting works from the European Cluster Observatory delivering the European Cluster Memorandum.

<sup>5.</sup> The correlation between clusters and regional specialization with higher levels of prosperity and innovation today is already proven. For more information, please see reference 59 DG ENTER-PRISE AND INDUSTRY REPORT (2008), Innovation Clusters in Europe: A statistical analysis and overview of current policy support.

In fact, the clusters have been and remain a planning and development of industrial action in Europe and in Spain<sup>7</sup> as well as in the Balearic Islands. As a result of work done since the beginning of this decade, in the Balearic Islands coexist in different clusters and innovation poles, promoted by the public sector. Some are in an embryonic stage more than others. These include:

- TurisTec (Innovative Business Partnership formally constituted)
- Nautical pole
- Aviation pole
- Cluster of tourism in the Balearic Islands
- Cluster of the audiovisual industry in the Balearic Islands<sup>8</sup>
- Cluster for the management of musical activity (Ibiza Music Tour)
- Biotechnology cluster Bio-IB

In recognition of the work done on previous plans and with a clear vocation of continuity, the S, T & I Plan (2009-2012) includes measures to support the clusters that have already been studied and established.

#### 2.3.4. "Transfer of Knowledge" Axis

The new innovation policies emphasize the value and transfer of knowledge meaning on the importance of combining basic research, aimed solely at producing new knowledge and for the scientific publications, with research being transferred to other organizations: mainly companies and institutions.

<sup>8.</sup> The cluster creation in this sector is a recent initiative which has the support of most of the sector. See SAITUR (2007) Prospective of the Audiovisual sector of the Balearic Islands and proposed definition of next steps towards the creation of an audiovisual cluster.



<sup>7.</sup> In this context it is important to know the claims and actions of the Ministry of Industry, Tourism and Commerce through the AEI (Innovative Business Partnerships) that combine innovative clusters in the same geographical area or industrial sector, enterprises, training centres and units of public or private research. These clusters are involved in collaborative exchange processes aimed at obtaining advantages or benefits from the implementation of innovative joint projects in all areas of technological, organizational, financial, marketing, in order to achieve critical mass that would ensure its competitiveness and international profile.

However, a number of challenges arise to accomplish these processes of transfer between public research institutions and companies:

- The lack of transparency of the research being done.

- The lack of guidance from the companies, sometimes, to manage their innovation. To resolve this problem should be strengthened the work done by the Researchers Support Office and the FUEIB, among other structures interface.

- The absence of market places.
- Cultural barriers in the way in which the university and companies use the knowledge.
- A different conception of time for action.

#### Leadership and management transfer initiatives

The S, T & I Plan prepares to create a Unit of Support for Innovation at the ParcBIT and accelerate the process to establish businesses, patents and copyrights.

One of the successes of the previous plans for innovation was the creation of the Technology Network as to support innovation and binding agents of the innovation system of the Balearic Islands to act as an interface.

This plan is to consolidate such a network, securing and improving the promoter and co-ordinating structure that exists in the ParcBIT and establishing a stable framework of actions to define the roles of each participant and the form of cooperation with the Balearic Islands Government.

Furthermore, technical support actions will intensify throughout the network: technological diagnostics, subdivision studies and pilot projects, training of the technicians who make up the network and activities to strengthen the corporate culture.



Finally, the S, T & I Plan also contemplates that, thanks to the Internet, it's possible to move in the transfer of knowledge between research groups and between them and the companies themselves. Hence the importance that universities and businesses are connected to the main nodes of knowledge, as the main intermediary, which are the source of many transfer projects.

#### 2.3.5. "Governance and social capital" Axis

Governance deals with the systems and practices that are used to set priorities and agendas, to implement policies and to provide knowledge about their impacts and effectiveness. The governance of an innovation system is beyond the government's action and responds to an interactive process that involves different forms of partnership, collaboration, competition and negotiation. Implicitly, governance is about accountability as the key to the research and innovation systems are well managed and effective.

In the global economy of the knowledge society is developing this new paradigm of open innovation, adapted to the context, indicating that currently there are multiple internal and external sources to generate the necessary inputs of knowledge in the innovation process. Innovation is not a process that originates in the R & D departments, but opens up and increases their relationships, uses internal and external input and also generates end products (outputs) in global markets, with more open business models.

Mobility, new access to knowledge via the Internet, a higher level of training, transfer of human capital, attracting talent, the ease to engage in business or the best exchange between companies and suppliers are factors that explain the emergence of open innovation.

Since the conviction that building networks of knowledge is a necessary asset and complementary to economical factors that traditionally influence on regional development, through this S, T & I Plan is to identify and involve key stakeholders in the Balearic Islands in the innovation process. At the same time, it is intended to develop interfaces and enabling agencies to help strengthen the positive impact of different initiatives taken.



The objectives that have been marked in this area are:

- Increase efficiency in the transfer of knowledge to improve the interplay between the players, encouraging participation and improving the interface of technology transfers to the productive network.
- Provide support for innovative players. Recognize entities, individuals and companies working to increase the level of science and innovation.
- Making good communications with the main cluster and networking business of the EU and the Euro region.
- Create a Unit of Support for Innovation at the ParcBIT.
- Review the institutional architecture of the Balearic Islands.<sup>9</sup> Science and Innovation System and the Law of Science.

Ambitious solutions for knowledge transfer require certain sophisticated governance schemes systems for science and innovation. As far as governance and social capital is concerned, this axis is divided into five complementary policies: international representation, professionalism and commitment of the SCIIB agents; methods of reporting and evaluation, institutional architecture for the SCIIB and social capital. Below, these points are briefly presented.

#### **International Representation**

Innovation leads to globalization or vice versa, through the internationalization goes the innovation, and management of this process requires skilled professionals to facilitate the relationship.<sup>10</sup>

It is known that the EU has incorporated measures aimed at strengthening institutional capacity, social capital in regions and learning processes between regions. For this reason has promoted the development of regional indicators and methodologies for the dissemination of good practices in policies for R & D. There have been carried out comparative studies of best practices in R & D policies,<sup>11</sup> in sectors of innovation<sup>12</sup> and table trends of innovation.<sup>13</sup> Statistics on research and innovation in the European Union carried out by Eurostat are regionalized, as it is the analysed information in the biennial

11. European Commission, 2002.

<sup>9.</sup> Organized in Cáceres (2008) for the Network CTI / CSIC, in the "National Meeting about Science Policy" was found that in Spain there is a problem of governance in the SCI. It also concluded that it was necessary to update the current legislative framework in R & D & I. The new approach should include aspects of political architecture, institutional and functional aspects of SCI and those with research staff, incentives in the private sector and public-private cooperation, relations between research and society and the management of R & D & I.

<sup>10.</sup> See conclusions of Mongofre Seminar: "Cooperation, trust and innovation in social networks de-territorialized and territorialised. The most important challenge of regional systems of innovation is to "promote the development of virtual social networks, de-territorialized, allowing remote cooperation with international partners, with whom the relationship is not dependent on physical presence and movement. Generate international confidence requires understanding, beyond the "corporate culture", the culture of the people to be treated, which may be diverse, but at the same time can have unexpected behaviours.

<sup>12.</sup> Innovation Scoreboard.

<sup>13.</sup> Innovation Trend Chart.

report on Science and Technology Indicators of the European Commission. Also, different networks have been established for the dissemination of best practices between regions.

In this context, it is necessary that the Balearic Islands Science and Innovation System is known and recognized internationally, it must evolve from experiences that have occurred in other regions and in collaboration with experts, entrepreneurs and people with influence at the international level. The S, T & I Plan recognizes and gives freedom to such need.

#### Professionalism and commitment of the Balearic Islands Science and Innovation System players

Recently, the Government has defined the quality policy through PEQ.<sup>14</sup> In the context of the governance system for science and innovation, this document may be an important benchmark: it is considered, for example, values of the quality policy the voluntary abandonment of positions, the improvement for attention to taxpayers, the periodic evaluation of the major agencies, services and public policy, or the momentum of the transparency and fairness.

More recently, during the Mongofre,<sup>15</sup> seminar, also noted that the reflection took place about concepts like "trust" and "cooperation", meaning on the possibility of relying on reputations of others in common systems and standards sanctions, among others, which are signs of a good endowment of capital and are at the basis of competitive advantage of systems based on innovation.

The set of PEQ strategic lines allow great challenges to improve not only the management of the Government, but of all the players that make up the system of science and innovation in the Balearic Islands. Some examples are:

- Raise awareness about the need to improve services.
- Listen to the voice of citizens<sup>16</sup> and incorporate the development of management plans, as well as improving information systems and attention.
- Knowing the maturity of the organizational elements of the macro system and boost public improvements.
- Recognize those who perform their job better.

<sup>14.</sup> Refers to the second Quality Strategic Plan from the Balearic Islands Government (2007/2014).

<sup>15.</sup> In reference, once again to the seminar of "Cooperation, trust and innovation territorialized and de-territorialised social networks"

<sup>16.</sup> Applied to the SCIIB governance, the more precise reference would be the one to the "beneficiaries" to policies, either to research centres, business, citizenship or other entities.

- Establish and publish service commitments with the public.
- Develop strategic alliances and promote quality service throughout the Balearic Islands.
- Promote training and knowledge management for improvement and change.
- Participate in programs and projects of e-Government.
- Institutionalize quality and promoting participation.

On the line to achieve higher levels of professionalism and leadership in academic entities, financial, manufacturing, services, intermediaries, government and people of science and innovation in the Balearic Islands, the S, T & I Plan intends to promote training in the public and private sector, personal with capacity to handle tasks associated with technological innovation.

It is important to train managers, but also there is a need to train technical staff of various levels (graduates, graduates of vocational training, etc..) through actions with different institutions.

#### Methods of information and assessment

To science and technology systems can be attributed or not, qualities such as intelligence, learning and experimentation, meaning that systems can be considered, in this sense, more developed than others in terms of penetration in the systems of evaluation methods and mechanisms of solid policies, before, during and after of its implementation.

Some significant examples of this theme are: institutionalize permanent working groups in the most strategic areas, establishing robust systems and relevant indicators or being in possession of information systems and integrated analysis for comparative research and innovation through international exercises.

The S, T & I Plan (2009-2012) is introduced by best practice system assessment and measures to raise the desire to have appropriate monitoring and evaluation practices that impact on knowledge and improving of the Balearic Islands Science and Innovation System.



#### Institutional architecture of the Balearic Islands Science and Innovation System

Recently it was reported that the security systems and controls enable the operation of the system is reliable. If confidence is a public good, of course, the public sector has a responsibility to promote it.

At this point, we stress that the axis "Governance" of this plan takes into accounts not only organizational forms and management of the Balearic Islands Science and Innovation System (clusters, brokers, parks, etc.) but also includes considerations about the technical meaning of that concept. In this sense, it addresses the professionalism of the players in the system and methods of reporting and assessment of which is endowed. And in the same trace, there is a technical work of revision of its institutional architecture.

The S, T & I Plan 2009-2012 will be an ideal framework to establish a rigorous and systematic debate on science and innovation policies, founding frameworks, the logics of the actors and the role of the autonomous communities. This is closely related themes, all with the present legislative framework.<sup>17</sup>

#### **Social Capital**

The Balearic Islands Government uses the concept of "social capital" to refer to the necessary united action, to the complex system of interaction between actors and institutions.<sup>18</sup> This comprehensive intervention scenario, the S, T & I Plan digs into the field of social awareness and adds particular importance to the promotion of scientific culture and innovation.

The objectives of this programmatic axis are:

- Disseminate through lectures, exhibitions and other events the assessment of science and technology among the general population and especially among the younger generations.

- Influence media content to generate awareness in science and innovation.

- To foster the system of science and innovation.

The first paper (entitled "The Governance of Science and Technology Policy"), presented at the National Science Policy, held in Caceres in May 2008 by a working group of the Network CTI-CSIC called " Group of political studies, economics and social affairs on science, technology and innovation, "said current and very interesting trends should be reviewed slowly.
 During the seminar "Cooperation, trust and innovation in social networks de-territorialized and territorialized" held in Mongofre Nou in March 2008 with the collaboration of the EMI-CIME and the CES of the Balearic Islands, there was talk of "social capital" as "the provision of resources for social cooperation", referring to the same broad meaning.



- Enhance the portal "Balears Innova",<sup>19</sup> as a vehicle of communication within the network and collaboration with the rest of the innovation system.

- Have a new flagship to disseminate science.

To address the need to disseminate science with rigor, skill and efficiency, and to implement reconciliation between science and society that makes possible the creation of a strong cultural base, there is a draft of the Balearic Islands Science Museum which joins this S, T & I Plan.

This museum will become a place to enjoy science and seek a balance between the elements and interactive exhibition, planned on a network, in order to incorporate and enhance existing resources from museums.

<sup>19. &</sup>lt;www.balearsinnova.net>



Science, Technology and Innovation Plan (2009-2012)



### 2.4. SYNTHETIC FRAME OF AXIS, PROGRAMS AND MEASURES.

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#### Table 4. Axis, programs and measures

AXIS	PROGRAM	MEASURE		
E	1.1. Students recruitment program	1.1.1 Pre-doctoral fellowships		
1. TALENT MANAGEMEN	1.2. Researchers mobility program	1.2.1 Travelling grants		
		1.3.1. IBREA		
	1.3. Attracting researchers program	1.3.2 Post-doc contracts		
	1.4. Training and antroproposition talant attracting program	1.4.1 Management training		
2	1.4. Training and entrepreneunal talent attracting program	1.4.2 Business stage		
		2.1.1 Excellence groups		
	0.1 Grant program for stratagic research	2.1.2 Competitive groups		
RESEARCH	2.1 Grant program for strategic research	2.1.3 Emerging groups		
		2.1.4 Especial actions		
	2.2 Research appreciation program	2.2.1 "Palanca" projects		
		2.3.1. SOCIB		
	0.2. Desservels infrastructure programs	2.3.2. CIDTUR		
5		2.3.3 Research centres		
	2.5. Research infrastructure programs	2.3.4 ParcBIT scientific complex		
		2.3.5 Other equipment construction		
		2.3.6 Working conditions for other scientific structures		
	3.1. Entrepreneurial innovation aid program	3.1.1 Key and strategic sectors: Entrepreneurial R+D promo- tion. Collaboration university-business and technologi- cal promoters		
NO		3.1.2 Knowledge/innovation intensive business. Business and university spin-off creation		
ATI		3.2.1 Turistec Cluster		
Q	3.2. Cluster programs	3.2.2 Tourism cluster		
3. INN		3.2.3 Other clusters: nautical, aeronautic, audiovisual, musi- cal producers Ibiza, biotechnology		
	3.3 Einancing mechanisms program	3.3.1 Capital-risk associations		
		3.3.2 Investors fairs		
	3.4. Public sector buyers program	3.4.1 Satisfactory demand to favour innovation		

		4.1.1 Parc BIT – Innovation Unit Support				
~		4.1.2 Presence of national and international organisations for knowledge intermediation				
TRANSFE	4.1. Knowledge brokers program	4.1.3 Technological centres				
		4.1.4 Fundación IBIT				
		4.1.5 Antennae Technological network. Coordination Knowledge brokers				
С		4.2.1 Business incubators				
ED		4.2.2 Bio-incubatory				
OWL		4.2.3 Entrepreneurial corporative motivation. Technological centres and business spin-off				
X X	4.2. Entrepreneurial motivational program	4.2.4 Entrepreneurial motivational contest				
4.		4.2.5 Advanced services for business. Projects raising				
		4.2.6 Business R+D projects. Driving projects				
	man and a second	5.1.1 Tourism technological European platform				
	5.1. International representation program	5.1.2 SCIIB ambassadors				
ITAI		5.2.1 Training concerning innovation				
AP	5.2. SCIIB agents professionalization program	5.2.2 Training concerning R+D&i aid				
IAL C		5.2.3 Training concerning communication between science & innovation				
00	5.2 Information and apparement program	5.3.1 Working group "innovation metrics. Innovation in tourism"				
S S	5.5. Information and assessment program	5.3.2 S, T & I Plan monitoring and evaluation commissions				
N	5.4. Governance structure programs	5.4.1 Commission to review Science Law				
Ш		5.5.1 Innovation conference				
N N		5.5.2 Conference series				
NA	5.5. Program to promote innovation	5.5.3 Communication plan "AccióBit"				
, ЕR		5.5.4 Best practices				
õ		5.5.5 INTO Seminar				
0		5.6.1 Science week				
<u>(</u> )	5.6. Science and technology promotion program	5.6.2 Science and technology fair				
		5.6.3 Science museum				



#### 2.5. GOVERNANCE MECHANISMS

#### 2.5.1. Governance

Governance is a factor that belongs to the research and innovation systems. This is the mechanism to define priorities and set the passage of the proposed new requirements imposed by the social and economic change. It is an instrument of participation of key factors involved in the generation and monitoring of public policies.

The goal is to define a clear interface between the public policies that come from the Parliament and from the Balearic Islands Government for a political initiative with involvement of key actors in the search system of innovation in the conceptualization, implementation and monitoring of policies developed in research and innovation. It is also very important that the intermediate agents are responsible for implementing policies, act strategically and efficiently.

In a research system such as the Balearic, a particularly important role of leadership and strategic direction is played by the University of the Balearic Islands, from which derives most of the scientific output. It is therefore important to determine its weight in bodies for the management of science, technology and also innovation remaining as the great challenge. It is also necessary to ensure the presence of those agents with greater capacity for business investment and innovation management. The direct presence of the decision-maker agents of innovation is important for a balanced system of governance.

The Plan for Science, Technology and Innovation aims to be the string that the actions of public officials and public-private projects inspire. Furthermore, it should stimulate more investment and private sector activity in research and innovation. The constant updating of the strategic plan, understood as a dynamic element that draws a stable horizon and at the same time, it provides mechanisms to catch up on a permanent basis, aims to be the foundation of the governance system.

It is proposed to continue the work of the Advisory Council on Science and Technology and takes as its mission the preparation of the annual Agenda for Science and Innovation as the basis for revising and updating the Plan for Science, Technology and Innovation.

The review phase will be implemented through a process of confrontation with the metrics specific to the execution of each step of the Plan and the contrast with the discontinuities and changes in the environment. Agenda setting processes will allow generating agreement on the desirability of maintaining or varying elements proposed in the Plan. To do this, it will maintain its philosophy and its main objectives, which will frame the stability of public policies on research and innovation during the period 2009-2012.

Law 7 / 1997 of November 20th, the Research and Technological Development is the regulatory framework for the conduct of these proceedings. This Act, in force in the Balearic Islands for over ten years, was a useful tool to set up the first plans. However, it has become outdated and need revision to suit the current situation of the innovation system and give it the necessary tools to face the challenges of the coming years, which should integrate the innovation system of the "Comunitat Autònoma de les Illes Balears" in its place by its economic weight.

Due to the wording of the law, it is necessary to make an accurate analysis of the current situation, of the needs of key players for the science and innovation system. Furthermore, it is necessary to define the lines of action to achieve greater cohesion of the bodies associated to the system. Therefore, there will be a review of existing bodies such as the Advisory Council and the Interdepartmental Commission of Science and Technology, or will be created, if necessary, bodies that are considered appropriate to improve coordination among all actors in the system. This will result in optimization of available resources to achieve the objectives of the Plan.

At a national and international level it could be established a Balearic network of talent people who have a relationship with the Balearic Islands and will occupy prominent places in research, innovation or business management or public organizations. Its aim is to define a range of opportunities in projects that may be of interest to agents of the research and innovation system in the Balearic Islands.

Furthermore, it can be of great interest to develop initiatives to assess the large number of people from other places in the world, especially Europe, which belong to companies, universities and organizations in which research and innovation are of importance. Maintaining a good relationship with the consular network in the island and explore the possibilities of attracting talent and projects is an initiative that can complete an international network of research and innovation in the Balearic Islands as an additional node of the high mobility generated by the tourism industry.



#### 2.5.2. Map of risks

Following are the potential risks associated with the possibility that the objectives defined in the S, T & I Plan (2009-2012) would not be achieved:

- Overly technocratic and regulatory S, T & I Plan, unsuited to the society and the eccentricity of the Balearic Islands.

- Little involvement or insufficient interaction between the agents, linked to the fact that they do not benefit of the aid provided of cooperative type in the S, T & I Plan.

- Excessive fragmentation of decision units, management and administration of subsidies linked to the S, T & I Plan (different ministries, island councils, municipalities, etc.) related to the eventual development of the ineffective Plan.

- Possible lack of vision and precision in one of the central axes of this S, T & I Plan: innovator tourism.

- Probable lack of specificity of action designed for businesses, in connection with its eccentricities and diversity of professional skills.

- Instrumentation that is not entirely satisfactory from the vision of the role of the University of the Balearic Islands as a prominent agent of the Balearic Islands Science and Innovation System, related to the third mission (contribution to social progress and wealth creation).

- Insufficient focus on the need to diversify the industrial structure of the Balearic Islands.

#### 2.5.3. Shares of institutional coordination and cooperation with other administrations

The Balearic Islands Government foster a cultural change and organizational within the structures of the regional government to make them more cooperative and flexible and less bureaucratic. In these circumstances, the government must become an agent of progress capable to develop an important role as catalyst and driving force for the innovation system.



In addition, a regional Plan for R & D needs to be open to cooperation with other regions of the world, since these activities are, by their nature, international in scope; however there is a need for being aware of the increased possibility of cooperation with other regions around the Spanish State and the European Union, of which one can obtain a variety of support.

Interregional cooperation should be encouraged by the proximity. In our case, are the regions around the Mediterranean, including the southern arc, which also is shared history and culture. It is also considered a priority in cooperation with other island regions in which there are other common factors, both through bilateral and multilateral organizations or programs, such as the Consortium of the Western Mediterranean Islands (IMEDOC). Besides, one of the first questions we must ask is whether knowledge management is to be carried out within the culture of competitiveness framework, with the side effects involved: inequality and social fragmentation, environmental degradation, the preponderance of force, and so on, Or if on the contrary, other alternatives cultures should be promoted. It seems that the regions of the Mediterranean, who have seen the emergence of cultures among its richness and diversity, are in good condition from which to share their experiences and work together on this and other areas of interest related to their common past.

Among the subjects for cooperation and interest to the Plan for Science, Technology and Innovation, include:<sup>20</sup>

- The creation or significant shift in competency centres (centres of excellence, technology centres or centres distributed on networks).

- Support for the creation of scientific and technological infrastructure (medium-sized facilities, infrastructure to support small groups of R & D within public centres, technology centres, etc.).

- Participation in financing the construction and operation of large scientific-technical facilities in a given region.
- Participation in the proposal, funding and implementation of strategic actions in a particular subject area.

- Co financing calls on the horizontal actions related to the National Plan, such as human resources training and support for the promotion and dissemination of results, both the nationals and the international R & D in the region.

- Other actions that the General Council of Science and Technology could agree to all the autonomous communities that fall within the actions and tools defined for the national Plan.

20. CICYT (1999)

The necessary funding to carry out such actions may be established using the budgeted funds of the autonomous communities and the State General Administration and the European Structural Funds. The general mechanism for setting the cooperation will be the establishment of a framework agreement between the Government of the Autonomous Region and the State General Administration.

Finally, the Plan must pursue a dual objective in its relations with the EU: achieving a greater number of European researchers to cooperate with their counterparts in the Balearic Islands in R & D projects aimed at solving socio-economic problems of the Balearic Islands and incorporated structural funds in their financing.





# 2.6. MECHANISMS FOR IMPLEMENTATION, MONITORING AND EVALUATION OF THE PLAN

#### 2.6.1. Model and resource management

The responsible unit for administering the Science, Technology and Innovation Plan of the Balearic Islands is the General Directorate for Research, Technological Development and Innovation (DGRDI) of the Ministry of Innovation, Internal Affairs & Justice.

Some of the main priorities of the Plan will be developed through competitive financial instruments (grants, fellowships...) and others are the result of agreements with other entities (e.g., program contracts and service contracts). The management of both types of instruments is different, as described below.

#### Management of competitive mechanisms

Very briefly, summarizes the most important stages in the management mechanisms that are implemented through public call:

- Elaboration of calls and publication in the Official Gazette of the Balearic Islands of calls for actions and programs (DGRDI).
- Reception administrative proposals submitted by the executing agents.
- Quality assessment (through ANEP or equivalent bodies) and the opportunity (through committees appointed by the DGRDI) and resolution of the proposals submitted.
- Administrative and budgetary management of approved applications.
- Monitoring implementation of approved proposals: technical and financial reports annually, according to a fixed format.
- Tracking results of the approved proposals: final technical reports (as a fixed format) and committee evaluation results with the presence of experts (scientists, technicians and business counselling or other areas affected).



#### Management of non-competitive mechanisms

The Plans is set to use some of the non-competitive mechanisms, as it requires the assistance of others official request or entities and, therefore, must be developed by processes negotiated with the partner or partners. Some of these processes to be mentioned are: contractual agreements, mixed-entities or companies, coordinated programs with the National Plan and with other autonomous communities, promotion of scientific culture, etc.. In these cases, the fundamental scheme of operation is as follows:

- Location of the partners.
- Negotiating the terms of the partnership: objectives, inputs from each partner, coordination and monitoring.
- Negotiating the agreement.
- Approval of the agreement by the competent bodies of the partners.
- Signing the agreement.
- Delivery of the funds.
- Monitoring.

Innovation policy should not be a subdivision policy in addition to more traditional policies of education, health, agriculture, fisheries, industry, environment, urban planning, etc., but a horizontal policy which is integrated into each of Councils of Government: knowledge and its application must be on the basis of other subdivision policies. In this sense, it is anticipated that the unit manager of the Plan and the various ministries to reach concrete agreements to develop joint actions in the framework programs.

#### **Resource requirements**

The General Directorate for Research, Technological Development and Innovation, as the manager of the Plan shall have the following human and material resources:

- Technical and administrative personnel management: ten senior technicians, four technicians and six administrative.



- Part-time support to external managers' expertise in each of the areas (depending on the number of programs and actions to be taken). It is desirable that each of the programs included in the Plan with a program manager to promote the active participation of agents in their actions, to ensure proper guidance and help before and after the evaluation of the proposals.

- Powerful IT infrastructure in order to computerize all activities (applications, awards), both for budget and administrative management as for the preparation of reports for required monitoring.

- Financial resources: managing the Plan requires not less than 5% of the budget allocated to the Plan as a whole. Below this minimum expenditure, investment in R, D & i allocated to the Plan will risk as failure or to be executed inefficiently.

They may also hire outside services to seek and develop indicators for monitoring the Plan and the development of the system, as well as for studies and evaluations that can advise the operation of various programs and activities.

#### 2.6.2. Assessment Model

The proceedings to be conducted under the Plan framework will be technically and administratively monitored to obtain information and data that is needed for the Plan to manage it effectively and efficiently. Technical monitoring can be done by obtaining different types of information, some are as described (partial and final reports) and, if appropriate, other oral assessments to expert groups, managers and stakeholders that are considered appropriate. However, we must take into account the difficulty of launching simultaneously all indicators, which is why it was incorporated in a progressive manner.

#### **Term indicators**

For each of the mechanisms and programs of the Plan tables will be developed with the following information:

- Number of projects submitted and approved by entities and location.
- Distribution of funds for programs and activities, indicating the source of funds and the relation of requested / granted.



- Percentage contribution to the Plan and the other sources of funding with respect to the total cost of each action, if any.

- Distribution of granted resources by type of participant, by entity and by geographical location.

- Mobilized human resources (number of participating researchers and share in total, to determine the level of participation of the components of the system in the Plan) by institution and geographic location.

In addition, the Plan will have a series of indicators to determine the degree of compliance with the overall objectives and at the same time, incorporate to the process of monitoring the evolution of the magnitudes and general variables that illustrate the evolution of the innovation system for the Balearic Islands.

#### **Performance indicators**

The results of activities financed under the Plan, which must be obtained from the final reports of the various funded projects are:

- National and international publications.
- Researchers and participating institutions in networks, agendas, etc.
- National and European patents.
- Other technological results obtained.
- Trained staff and incorporated into the system.
- Percentage of sales of innovative products for innovative companies that participate in the Plan (by sector).

#### Indicators for assessing the innovation system

Following are the selected indicators to analyze the evolution of the innovation system for the Balearic Islands.

- Resource indicators:

- Increased spending on R & D personnel and number of researchers. Relative indicators (relative to GDP and active population, respectively).<sup>21</sup>

- Capital/risk societies.22

- Indicators of structure:

- Evolution of the structure of spending on R & D, R & D personnel and researchers in the Balearic Islands (business / government / university / IPSFL).<sup>23</sup>

- Indicators of innovation in the Balearic Islands: percentage of innovative enterprises, innovation intensity (innovation expenditure / turnover).<sup>24</sup>

- Descriptive information about: new R & D centres established (indicating the location, staff and business area), new entities in the technological environment (with an indication of the location and scope), new interface structures (with the location and scope), new laws, rules or regulations that can foster innovation in the Balearic Islands.<sup>25</sup>

- Indicators of takeover capacity:

- Evolution of the progress of the occupation in the Balearic Islands (education level of workers in each industry).

- Increased company staff with a university education.

- Occupancy rate in high-tech sectors (office machinery, computing and computers, electronic equipment, chemi-

<sup>21.</sup> Source: INE.

<sup>22.</sup> Source: <http://www.ipyme.org/temas/empresas/scr.htm>

<sup>23.</sup> Source: INE.

<sup>24.</sup> Source: INE.

<sup>25.</sup> Source: produced by the General Directorate for R, TD & I from the Balearic Islands Government.

cals and pharmaceuticals, scientific instruments, vehicles, electrical machinery, machinery and mechanical equipment and machinery and transport equipment).

- Percentage of employment in knowledge intensive services (communication services, financial intermediation, insurance, business services, including IT, R & D services, utilities, social and collective).

- Increased number of researchers in enterprises.

- Relative increase in the technological environment and advanced services (percentage of spending and R & D personnel with respect to the total).<sup>26</sup>

- Indicators of articulation:

- Percentage of expenditure on R & D by sectors of administration and higher education funded by companies.

- Indicators of innovation in the Balearic Islands: participation in R & D programs and cooperation with other partners.<sup>27</sup>

<sup>26.</sup> Source: INE and Eurostat. 27. Source: INE.



#### 2.7. BUDGET

#### 2.7.1. Financial Instruments

The objective of financial instruments is to provide financial resources to enable to perform satisfactorily all steps of the various programs of the Plan. A financial instrument can be used to formalize different measures and in some cases, a certain measure may need the addition of various instruments.

Mainly, the following tools will be used:

- Grant: instrument that covers all or part of the activity carried out with either a percentage of the total cost or marginal (additional costs for the activity).

- Fellowship: a public aid whose recipient is wholly or partly a physical person, whose training is the subject of the instrument.

- Program contract: agreements between the parties with measurable goals and commitment for co-financing and responsibility.

- Services contract: instrument that meets a monetary compensation for a job whose conditions have been agreed by the parties.

#### 2.7.2. Analysis of the financial scenario

Below is a foresight exercise on the changes that may be experienced by funding of R & D in the Balearic Islands during the term of the Science, Technology and Innovation Plan (2009-2012). This is to highlight the difficulties associated with the fact to achieve certain values in the percentage of R & D spending relative to GDP and how it affected other indicators of R & D activities.

In 2007, the share of R & D expenditure to GDP in the Balearic Islands was 0.33%, while at the national level was 1.3%, as published by the INE. From these data, it appears that the effort in R & D of the Balearic Islands is still low although it has



experienced a growth rate of 22.8%, which is higher than the national average, which stood at 13.1%. To reach the national average, the Balearic Islands must grow much faster than the national average. To operate this convergence process it may take various rhythms and the process can affect the structure of the innovation system in the Balearic Islands in different ways.

To make an estimate of the potential impact of the effort made by the Balearic Islands Government in this Plan and to anticipate how it should change its system of innovation, it has have been calculated based on different assumptions, two financial scenarios, with the purpose to show in a simple and yet clear way, the practical implications of the possible strategies to be adopted. An analysis of the evolution has been conducted that the system may experience during the period 2009-2012, to show the difficulties inherent in the fact to achieve certain values in the percentage of spending on R + D + i relative to GDP and the way they are affected other indicators of R & D activities.

The analysis is performed by changing different indicators and studying their evolution. The data come from the INE and correspond to 2007, since they are the last to be published when the Plan was developed.

#### About the R +D +i expenses

Both the first R +D Plan (2001-2004) as in the S, T & I Plan (2005-2008) raised a series of hypotheses about the evolution of R & D expenditure on GDP. For the period 2003-2009 was considered a scenario in which the evolution of R & D expenditure to GDP increased from 0.25% to 0.35%. According to INE, in 2007 this value was 0.33% at a cost of 86,794 thousand Euros. S, T & I Plan (2005-2008), for the year 2007 was 0.33% above expected but with a less expenditure, indicating that the forecasted for the GDP was not adequate.

For the period 2007-2012 two series of GDP for the Balearic Islands were reviewed in order to define two scenarios, one conservative and one optimistic. The series of GDP of the Balearic Islands (base current euro 2000) was obtained from data from INE (Regional Accountability, 2008) and projections for the years 2008 and 2012 which has developed the General Directorate of Economy of the Balearic Islands Government.



	2007	2008	2009	2010	2011	2012
Conservative scenario	25.943.765	26.332.921	26.543.585	26.809.021	27.345.201	28.165.557
Optimist scenario	25.943.765	26.332.921	26.543.585	26.941.739	27.696.107	28.665.471

#### Table 5. GDP Evolution for the Balearic Islands in the period 2007-2012

Source: INE and own source

We will consider two developments in the share of spending on R & D on GDP:

#### Table 6. Evolution of DRD ratio to GDP during the period 2007-2012

Conservative scenario	0,33% al 0,50%
Optimist scenario	0,33% al 0,70%

Source: INE and own source

In the conservative scenario, the value of R & D expenditure to GDP increased from 0.33% to 0.50% and its increase is considered to be progressive. From here we can calculate the R & D expenditure needed to obtain these percentages to the R & D expenditure on GDP.

With respect to spending on innovation, this represented 0.59% of GDP in the Balearic Islands in 2006, well below the national average, which was a 1.69%. If the changes in this percentage are similar to the percentage of R & D spending relative to GDP, we can formulate the hypothesis that in the year 2012 will be 0.80% and be able to calculate, therefore, necessary spending on innovation.

Table 7. Spending on R & D during the period 2007-2012								
	2007	2008	2009	2010	2011	2012		
Expenditure R & D / GDP	0,33	0,36	0,40	0,43	0,47	0,50		
R & D expenditure (thousands of euros)	86.794	94.799	104.847	115.279	127.155	140.828		
Expenditure Innovation / GDP	0,62	0,65	0,69	0,73	0,76	0,80		
Innovation expenditure (thousands of euros)	160.394	172.373	183.401	194.981	208.821	225.324		

Source: INE and own source

#### About the structure of expenditure on R & D

The innovation system in the Balearic Islands has a strong structural imbalance, since the so-called scientific environment, which include both the University and research centers from the public administration, made the 79.1% of total R + D. Companies in the Balearic Islands barely produce any R & D activity.

In part, the small business sector's effort in the Balearic Islands is due to the regional production structure, meaning low weight of the industrial and telecommunications services, which are conducting the largest effort in R & D + i nationwide. The innovative effort of firms in the Balearic Islands is due mainly to other innovative activities rather than to R & D.

What we want to raise is a favourable situation to increase innovation in the Balearic Islands, where the R & D performed by the productive environment may be increasing from 19.0% in 2006 to 30% in 2012.

				0		
	2007	2008	2009	2010	2011	2012
Productive environment (thousands of euros)	20.876	21.507	25.703	30.368	35.822	42.248
% Executed	20,86	22,69	24,52	26,34	28,17	30,0
Scientific environment (thousands of euros)	65.918	73.292	79.144	84.911	91.333	98.579
% Executed	79,1	77,3	75,5	73,7	71,8	70,0

Table 8. Subdivision distribution of expenditure on R & D during the period 2007-2012

Source: INE and own source

According to INE data for the period 2000-2007, to calculate spending per researcher in the production environment as in the scientist does not show a clear trend. For this reason, it has been decided to take a constant value throughout the period 2007-2012 equal to the average value for the last six years. These data allow determining the approximate number of researchers to be achieved in both environments at the end of the period of the Plan.



for the period 2007-2012						
	2007	2008	2009	2010	2011	2012
R & D expenditure per researcher productive environment (thousands of euros)	120,80	117,53	117,53	117,53	117,53	117,53
Researchers productive environment (EDP)	172,80	182,99	218,70	258,39	304,80	359,48
R & D expenditure per researcher scientific environment (thousands of euros)	71,50	71,23	71,23	71,23	71,23	71,23
Researchers scientific environment (EDP)	921,90	1.028,90	1.111,05	1.192,01	1.282,18	1.383,90
Total researchers (EDP)	1.094,70	1.211,89	1.329,76	1.450,40	1.586,97	1.743,38
* FDP: Full-time equivalent						

#### Table 9. Changes in the number of researchers and spending per researcher

Source: INE and own source

Based on these assumptions, it follows that to increase the share of R & D spending relative to GDP a 1.54 in the year 2012 is necessary to increase spending on R & D a 1.62 compared with the 2004 and a 1.59 increase the current number of researchers from the Balearic Islands.

If we repeat the process from the evolution of R & D expenditure to GDP from 0.33% to 0.70% (optimistic scenario), we obtain that the R & D expenditure to GDP in 2012 should multiplied by 2.31 and therefore a 2.17 the number of researchers.

In the end, these scenarios illustrate the economic and human effort that involves the fact of reaching a specific goal in relation to expenditure on R, D & i. This plan must consider the real possibility that their resources can, not only provide funding to the system, but primarily to mobilize actors from the different environments to make the appropriate additional funding with which the system of Innovation will count on the Balearic Islands.



#### 2.7.3. Budget Plan

The Science, Technology and Innovation Plan of the Balearic Islands (2009-2012) will be funded from the general budget of the Balearic Islands Government, with community funds and with national funds and input from other public or private entities that participate or will be interested in furthering the projects of scientific or technical research.

The table below shows the contribution to the Plan from the General Directorate for Research, Technological Development and Innovation of the Ministry of Economy, Finance and Innovation of the Balearic Islands Government.

			, <b>.</b>				
	STI Plan (2009-2012)						
	2009	2010	2011	2012	Total		
Axis 1. Talent management	3.451.966	3.624.564	3.805.793	3.996.082	14.878.406		
Axis 2. Research	7.484.493	7.858.718	8.251.654	8.664.236	32.259.101		
Axis 3. Innovation	7.426.531	7.797.857	8.187.750	8.597.137	32.009.275		
Axis 4. Knowledge transfer	2.958.685	3.106.619	3.261.950	3.425.048	12.752.303		
Axis 5. Governance and social capital	2.177.651	2.286.533	2.400.860	2.520.903	9.385.947		
Total (euros)	23.499.326	24.674.292	25.908.007	27.203.407	101.285.032		

Table 10. Contribution from the General Directorate for Research, Technological Development and Innovation

Figure 6. Contribution from the General Directorate for Research, Technological Development and Innovation STI Plan (2009-2012)





To the previous budget we must add the contributions of the different councils of the Balearic Islands Government to boost R & D activities during the years 2009-2012. Therefore, the contribution from the Government of the Balearic Islands is:

Ministries	2009	2010	2011	2012	Total
Social affairs, promotion and immigration	6.806.771,53	3.077.726,96	3.139.281,50	3.202.067,13	16.225.847,12
Agriculture and Fisheries	1.350.000,00	1.433.250,00	1.504.912,50	1.580.158,13	5.883.320,63
Commerce, Industry and Energy	803.250,00	843.412,50	885.583,13	929.862,28	3.462.107,91
Economy, Finance and Innovation	23.499.326,00	24.674.292,30	25.908.006,92	27.203.407,26	101.285.032,48
Education and Culture	21.980.231,00	23.113.334,00	24.417.771,00	25.553.879,05	95.065.215,00
Environment	987.000,00	1.036.350,00	1.088.167,50	1.142.575,88	4.254.093,38
Presidential	55.318,20	58.084,11	60.988,32	64.037,73	238.428,36
Health & Consumption	22.238.775,15	23.150.183,91	24.098.262,70	24.979.329,14	94.466.550,90
Work and Training	630.000,00	661.500,00	694.575,00	729.303,75	2.715.378,75
Tourism	676.000,00	709.800,00	745.290,00	782.554,00	2.913.644,00
TOTAL (euros)	79.041.671,88	78.757.933,78	82.542.838,56	86.167.174,29	326.509.618,51

#### Table 11. Government transfers STI PLAN (2009-2012)

#### Figure 7. Government transfers STI PLAN (2009-2012)



