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The transformation of Andalusia 1990-2010

20 years of the Institute of Statistics of Andalusia

JUNTA DE ANDALUCIA
Instituto de Estadística de Andalucía
CONSEJERÍA DE ECONOMÍA, INNOVACIÓN Y CIENCIA

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Summary

La transformación de Andalucía 1990-2010

Statistics

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Presentation

Statistics play a key role in the development of democratic societies. If a society does not know where it is and where it comes from, it is impossible to take appropriate measures in order to continue progressing. Statistical information is essential to help policymakers, businesses and citizens understand the facts and formulate their future strategies.

In an era of rapid changes when societies must face new challenges, the mission of the official institutions responsible for elaborating statistics is to offer a clear view of the multiple factors that affect citizens´ well-being and quality of life and social, economic and environmental sustainability.

The celebration of 20 years of the Institute of Statistics of Andalusia is a timely opportunity to illustrate how the Statistical System of Andalusia meets the main objective it is entrusted with as a public service: providing the appropriate information allowing the Andalusian society to make decisions based on totally reliable data.

Without a high quality statistical system it is very difficult to succeed in the planning, management and evaluation of public services. This journal shows how statistics allow the observation of the achievements in health, education, environmental, infrastructure and R&D policies, and the areas where improvement is needed.

In times of crisis such as these, it is even more important to combine short-term and structural information, in order to permit maximum flexibility and advance effectively towards a new economic and productive model.

Having a well-informed society is a necessary precondition for progress; hence we should all congratulate ourselves for the hard work of people who have contributed to make the IEA and our statistical system as a whole a benchmark of good practice in their task of meeting the information needs of Andalusians.

José Antonio Griñán Martínez
President of the Junta of Andalusia

Statistics

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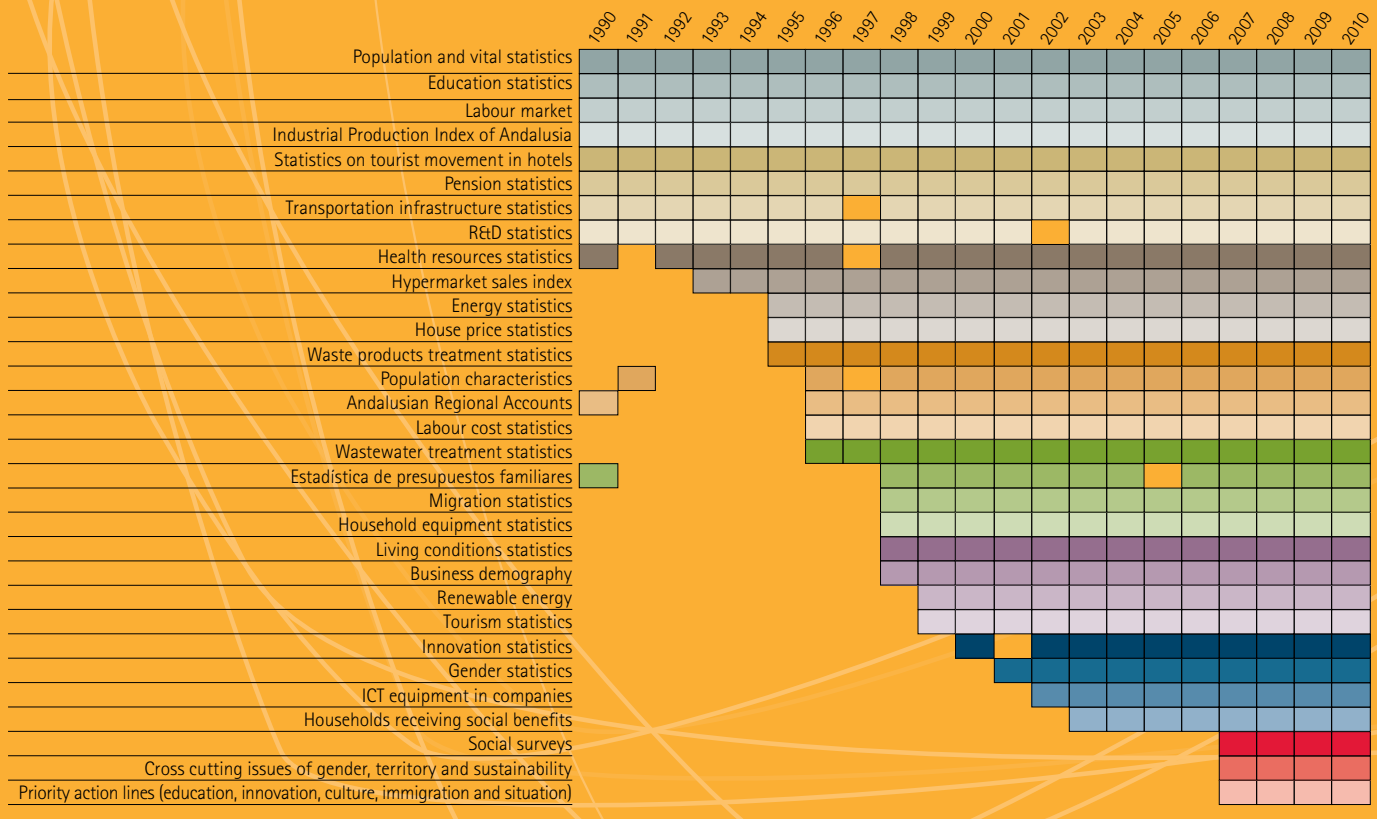
- Evolution of production of the Statistical System of Andalusia.

- El Sistema estadístico andaluz ha pasado de realizar 31 actividades estadísticas a 288 en 2010.



20 years of Statistics in Andalusia

Ignacio Pozuelo Meño
Director of the Institute of Statistics of Andalusia

With this issue we begin a new stage of the journal "Statistical Information of Andalusia", commemorating the 20 years that have elapsed since the creation of the Institute of Statistics of Andalusia, with a monograph analyzing the development of the Autonomous Community in this period.

The transformation of Andalusia in the last 20 years is understandably a process that can be analyzed from multiple perspectives. Beyond the different circumstances our society has experienced and experiences (and evidently the most recent period of economic crisis is clearly reflected in the data), this transformation is highly structural.

Based on data from official statistics it is possible to undergo a systematic journey through those elements that best define the momentous change experienced by Andalusia and that enables us to show a quick picture of how we were in 1990 and how we are in 2010.

Our purpose has been to portray, in summary, the evolution of society, the territory and economic activity and, in parallel, the evolution of public statistics, where changes in the last 20 years, have not been small.

To this end, we have enjoyed the collaboration of noteworthy people in each of the fields analyzed and who, chiefly, have also been key actors at the forefront, each in his/her professional field, of the aforementioned transformations.

The authors, from their independent and invaluable reflections, have made an effort which we believe has been worthwhile. Their narrative of the changes experienced in Andalusia goes beyond a mere conjunctural analysis and we, honestly, believe that it will remain a lasting contribution.

We would, especially, like to mention the coordination of this issue of the Journal by Josefina Cruz Villalón, a task she carried out until her appointment as Regional Government Minister of Public Works and Housing of the Junta of Andalusia.

1. Statistics of Andalusia

Just like Andalusia, statistics have also grown and changed dramatically in recent years. The Institute of Statistics of Andalusia is today a consolidated organization and leader in many fields inside and outside Andalusia. This is due, among other things, to the professionals who have worked and are currently working in it.

With respect to changes in statistics and the continued improvement of techniques for the measurement of reality it is sufficient to note how, from the mid-1990s, the first web page of the Institute was initiated, pioneering the use of the network for the dissemination of statistics.

A tool like the Internet, which is nowadays indispensable for almost all activities, and is already part of our daily lives, makes us think how could we have done our work before?

In this sense, the Institute of Statistics of Andalusia is primarily a public service. Our mission is to produce

objective, verified information using the latest internationally applied methodologies and the recommendations contained in the Statistics Code of Practice approved by the European Union which we have fully assumed.

Evidently, the Institute does not evaluate or interpret the information produced. Precisely, the aim is for this information to be useful for public administrations, economic and social agents, companies, researchers, students, media, etc. Ultimately, that society converts this information into knowledge that becomes useful for decision making, which characterizes advanced societies.

The journal Andalusia Statistical Information seeks to be, therefore, an instrument through which the Institute gives a voice to scholars to express their reflections on the statistical information we elaborate. Therefore, the opinions, analysis and evaluations outlined here are the sole responsibility of the authors and the institute only offers the platform of the Journal.

Therefore, if the statistical information makes sense through its use in the analysis of social, economic and territorial cohesion and, consequently, its role in making public, private, collective and individual decisions, it is clear that the role of regional statistics must have specificities, that differ in their usefulness from international or national statistics.

Indeed, for the Autonomous Community of Andalusia and, in reality, for any regional statistical institute, statistical production must be directed, preferably, at covering different needs.

First, it has to be a useful tool for the management of the competences of the Government of the Autonomous Community, especially important in a deeply decentralized state such as ours. In this line, regional statistical activities must be directly linked to the information needs of each and every one of the government departments that are ultimately responsible for the development of a great deal of official statistics and that otherwise, would not have sufficient objective basis for the design of regional policies and decision making.

Second, the territorial scope of the statistical information of the Autonomous Community means that a higher degree of spatial disaggregation of information is a key feature for making sense and specific utility of regional statistics. The information needs, not only of government but of business, social agents, researchers and citizens, requires information to descend to a comprehension of realities on a scale of much greater detail than national statistics.

In the case of Andalusia, this last question takes on fundamental importance: a population of over eight million people and an area larger than many European countries and the enormous physical, economic and social complexity and diversity, make the need for information with sufficient spatial resolution evident.

Therefore, the special territorial demands of regional statistics in Andalusia means that technological and conceptual process of convergence between statistics and geographic information technologies becomes increasingly more important. The same as at international and national levels, statistics must rely ever more on information management systems that link to the space that nowadays have become indispensable tools to perform more complex analysis of information and add a clear additional value to mere statistical information.

For its part, the traditional concept of a map has become, nowadays, that of geographic information system. Precision mapping requires today, largely, statistical accuracy. This process, very powerful internationally, finds in regional statistics a particularly fertile field because, as previously noted, much of its raison d´être is precisely its need for spatial disaggregation.

Regional statistics in Andalusia has undergone, therefore, an intense process of growth, modernization and consolidation in the last 20 years becoming a vital public service for government and society as a whole. The challenges of the coming years focus on strengthening the technical capacity to provide greater and more rigorous information and, especially in developing more effective dissemination of statistical information, that is, increase the effectiveness of statistics making them more accessible to the whole society and each and every one of the users.

This will require strengthening communication channels, especially through the Internet, with new tools which permit the use and substantial cross reference of databases so that each user can make a more simple and at the same time, more efficient and specific use of the information.

But it will also require a communication strategy to improve services provided to certain user groups and information producers.

Together with improving the efficiency of the statistical system of Andalusia, carrying out, for example, a much more thorough and systematic screening of individual administrative records, we must be able to generate new services tailored to the needs of companies so that official statistics also become a tool for the development of their activity, or we must be able to make the media use statistical information more intensively and make it more accessible and understandable to all citizens. Similarly, we have to develop tools that allow statistics to become a commonly used instrument at all levels of education and, of course, ensure that we have specialists in Andalusia specifically trained in the discipline of statistics.

In short, the complete opening up of statistical information, its transparent dissemination, and the improvement of the skill levels of users and producers will ensure that statistics in Andalusia remains, as in more developed countries and regions, a basic and essential element of advanced democracies.

2. The contents of the Journal

The content structure of this issue had to face, from the very first moment, the difficulty of selecting the themes and approaches, so that the overview of the transformation of Andalusia in the last 20 years was sufficiently complete and systematic, taking into account, however, that for reasons of space, it was not possible to address all the issues nor to the extent that many would require. This has meant that, alongside articles that address structural aspects of the evolution of Andalusia, the addition of brief articles to draw attention to specific issues that provide further reflection, has been sought.

Therefore, we have chosen a sequence that addresses the following issues:

- A first section-statistics- dedicated to the presentation of the basic features of the current Statistical *System of Andalusia* and the steps taken for its formation, and a brief history of the development of the Institute of Statistics of Andalusia and the challenges it faced at the time, and the new challenges that lie ahead after 20 years of existence. These articles are complemented with a specific collaboration of the National Institute of Statistics and a reference to two transcendental issues: the relevance and the changes experienced by the dissemination of statistics, specifically through the use of the Internet, and one of the habitual difficulties of regional information such as the insufficient consideration of certain economic data due to the effect generated by the location of the headquarters of companies.
- A second set of articles- the economy- which gives an overview of the evolution of major economic figures in Andalusia in the last 20 years, the transformation of business and the role, ever more decisive, played by innovation processes in the context of sustainable development and globalization. These features are complemented by articles that address such issues as the insertion of the Andalusian economy in the national and international context, foreign trade, changes in the labour market, guidelines for a more sustainable economy and the trajectory of 20 years of R&D in Andalusia.
- The third section of the journal is devoted to the analysis of the main processes of transformation of Andalusia and the state of the environment. These chapters are supplemented with brief references to aspects such as the evolution of the housing market, new systems of territorial representation, and the prospect of Andalusia facing climate change, and ecosystems and protected natural areas.
- The fourth block of the Journal addresses the changes in the Andalusian society, both its population and their own

assessment of themselves. An article centered on the changing role of women in our society is also included.

- The last section shows the evolution in two essential public services such as health and education, completed with specific reference to Andalusian universities.
- Finally, in an annex, a synthetic overview of the evolution of Andalusia in the period 1990-2010 is provided through a series of statistical indicators relating to economic, territorial, environmental, social and public services aspects.

It only remains for us to thank everybody for their participation with their articles and contributions which have undoubtedly enriched the scientific view of the changes that our community has experienced in the recent historical period, contributions, as mentioned earlier, we are sure will endure.

Likewise, we believe that it is fair to acknowledge the professionalism of all the people who work and those who have worked at the Institute, day after day, making it possible, over the last 20 years, to build an instrument at the service of the Andalusian society whose activity is indispensable to know, objectively, about our past and our present and which must continue guaranteeing our future.

And the readers, the true recipients of this journal, thank you for opening these pages, something perhaps unusual in the era we live in, but necessary nonetheless, if we want along with the vast amount of information speeding between us, opportunities for reflection and analysis, requirements without which information is not strictly knowledge, the most powerful tool we have to develop individually and collectively. ■

Photo: Antonio Gaga

The Statistical System of Andalusia:

20 years of work to know in depth the Andalusian reality

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1. Introduction

Statistics has experienced an impressive development since the last quarter of last century, not surprisingly in a society we have agreed to call the Information Society, in which there is an increasing demand for information, and especially, as statistics is one of the fastest, finest and most versatile instruments available to analyze and interpret what is happening.

There are many sciences that attempt to describe social phenomena, from the analysis of its causes to the prediction of its evolution. What characterizes statistics is the use of a set of quantitative tools to synthesize large amounts of data into sets of indicators that provide a simplified picture of reality, which facilitates knowledge of it and decision-making.

Official statistics are a public service, designed to identify the economic, geographic, social, cultural, environmental, demographic and territorial reality by providing complete, objective and unbiased information to the society.

Knowledge of reality must be transcendental to set public policy.

The mission of official statistics is to satisfy demand for information generated by the process of assuming competences and transferring functions and services from the State to Autonomous Communities.

Official Statistics[1] is today an essential element of any democratic society. Without the existence of a strong statistical system the proper functioning of various areas of economic and social activity would not be viable. A key for the development of a society is to have objective, high quality information sources appropriate to meet the information needs of families, social partners and governments.

The mission of regional official statistics is to satisfy demand for information generated by the process of assuming competences and transferring functions and

1. Official statistics are carried out by statistical agencies strictly following transparent procedures. In Andalusia only statistical activities of interest to the Autonomous Region in the plans and annual statistical programmes, and other statistical activities declared of interest to the Autonomous Community of Andalusia by the Institute of Statistics of Andalusia or authorized by the Governing Council are considered official statistics

services from the State to the Autonomous Communities, that demands more and more disaggregated information and, at the same time, of easier comparison with other territories. Faced with the growing demand for new data and a further disaggregation of all information, statistical production by the General State Administration is insufficient to meet the specific needs arising from each territory. As noted in the Manifesto of the Central Statistical Agency of the Autonomous Communities to mark the first world day of statistics: "The development of official statistics in the regions is performed in order to meet the growing needs of information imposed by the decentralized structure of Spain. Official autonomous statistics have specific positive characteristics: obtaining sufficiently disaggregated information, proximity to suppliers and users of the information, easier and more fluid communication with agents, implementation and maintenance of sectoral information systems, appropriate to the territorial structure such as health, education or judicial information systems, the power to intervene in the design and creation of administrative records or sample making process with adequate territorial significance. Thus, the regions have made use of the powers contained in their Statute of Autonomy, so that now almost all of them have statistics laws and statistical agencies, the majority configured as Autonomous Institutes of Statistics.

The history of regulation of the statistical activity in Spain dates back to the Constitution of Cadiz of 1812 that assigned the provincial delegations functions "to form the census and statistics of the province", while the origin of the statistical activity of the autonomous communities is derived from the development of the current Constitution of 1978 in which statistics appear as an express constitutional mandate over which the State reserves the exclusive jurisdiction in "statistics for their own purposes," although the text does not specifically mention the role of autonomous communities in the national statistical system. However, the evident importance and significance of the statistical function in any government led to the inclusion in each statute of autonomy of the power to "produce statistics for their own purposes". Thus, Article 13.34 of the Statute of Autonomy for Andalusia, approved in 1981, establishes as an exclusive competence, statistics for the purposes of the Autonomous Community. In furtherance of this responsibility, in the mid-eighties a Bureau of Statistics, two Statistics sections, and finally, a Statistics Service attached to the General Secretariat of Economy of Andalusia were created in order to meet the demands of statistical information that arose in the process of transference of functions and services from the Central Government to the Autonomous Community.

2. The Legislative Development

The institutionalization of the Statistical System of Andalusia begins with the enactment in December 1989, Law 4/1989 on Statistics for the Autonomous

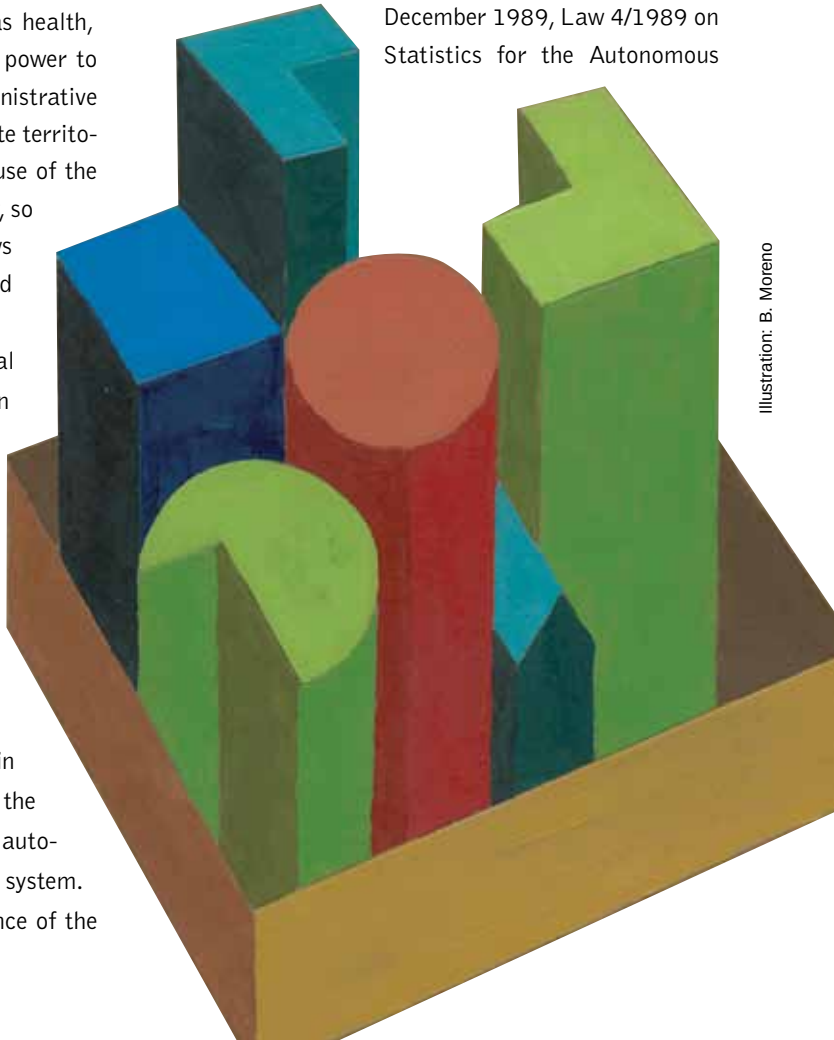

Illustration: B. Moreno

Community of Andalusia, which creates the Institute of Statistics of Andalusia, as an autonomous administrative body attached to the Regional Government Ministry of the Presidency, and establishes that the regional government ministries and autonomous agencies or public entities dependent on them can have their own statistical units, and creates the Andalusian Council of Statistics as the highest advisory body for statistical activity.

Law 4 /1989 states that public statistical activities should be carried out in a planned way, contemplating the existence of a statistical plan, approved by Act of Parliament of Andalusia, with a duration of four years, and successive annual statistical programmes approved by the Governing Council of the Junta of Andalusia within the framework of the relevant Plan. This form of planning is also used by Eurostat, the National Institute of Statistics and some autonomous communities. But it should be noted that in Andalusia in the definition of public statistical activity a special role is given to the people through their representatives in Parliament, given that the successive statistical plans must be passed by law and not by agreement of the Governing Council as in the General State Administration and in various regions.

Law 4 /1989 does not define what is meant by the Statistical System of Andalusia, and only refers to it in the preamble when it states that it must "conceive our statistical system so that the information generated on the one hand , reflects the reality of our community with the necessary details in each case, and on the other ensure the exchange and comparability of our statistics with those of other communities and national and supranational organizations, while ensuring that the methodology used for achieving the above goals." The first definition is made by Law 6/1993 of 19 July, Statistical Plan of Andalusia 1993-1996, which envisages the progressive establishment of the Statistical System of Andalusia "understood as the orderly and harmonious set of methods, procedures and results of different institutional actors ', and considers the Statistical Institute of Andalusia as the system manager.

Law 4 / 1998, of 1 October, the Statistical Plan of Andalusia 1998 to 2001 marked the second year of planning public statistical activities in Andalusia. In the preamble it states that the Law "through a model of planning by objectives, pursues the development and consolidation of the Statistical System of Andalusia, so as to provide public entities, economic and social actors and the society in general, rigorous and updated information, sufficient and consistent, allowing better understanding and analysis of the economic, demographic, social, environmental and territorial reality of Andalusia.." Article 3 of this Act states that "the Statistical System of Andalusia is the orderly and harmonious set of methods, procedures and results of statistical bodies responsible for implementing this Plan and the Annual Statistical Programmes that they develop," so as to identify which are 'diverse institutional actors of it "set forth in the Law 6 / 1993.

The implementation of the first three statistical plans allows the development of a set of elements whose interaction permits the existence of a true statistical system.

Law 8 / 2002 approves the Statistical Plan for Andalusia 2003-2006, and makes the first amendments to Law 4/1989, including activities aimed at systematizing statistics of interest to the Autonomous Community of Andalusia and the way they are carried out, the establishment of the regulatory framework to enable agencies and organizations outside Andalusia to produce official statistics. According to this plan the Statistical System of Andalusia is "the orderly and harmonious set of concepts, classifications, methods, procedures and results as well as the organization to implement the plan and the annual statistical programmes which it develops in accordance with the provisions of Chapter II of Title II of Law 4/ 989, of 12 December, on Statistics of the Autonomous Community of Andalusia. Therefore, it replaces the concept of "statistical bodies responsible" by "organization for the implementation" of the Annual Plan and Programmes.

The implementation of the first three statistical plans allows the development of a set of elements whose interaction brings a real statistical system into existence. On this point, Law 4/2007 of 4 April ends the first twenty years of operation of the Statistical System of Andalusia and performs a second set of amendments to Law 4/1989 and approves the Plan 2007/2010.

Highlighted among the changes is the creation of the Interdepartmental Commission for Statistics configured as the body responsible for determining the direction and lines of horizontal coordination of the Statistical System of Andalusia.

The process of public participation, elaboration and processing of this Act is made to coincide with the reform of the Autonomous Statute promulgated by Law 2/2007 of 19 March, which in Article 76.3 states that "the Autonomous Community has exclusive competence over statistics for purposes of the Community, statistical planning, creation, management and organization of a statistical system. The Autonomous Community of Andalusia will participate and collaborate in the development of statistics at supra autonomous level. "

Therefore, Law 4/2007 pays special attention to the regulation of the Statistical System of Andalusia understood as "the orderly and systematic set of entities and bodies in charge of conducting activities necessary for the collection, storage, processing, compilation, analysis and dissemination of statistical information for the purposes of the Autonomous Community." It is therefore this definition we use to describe the evolution of the system in the twenty years since the launch of the Institute of Statistics of Andalusia.

3. Statistical planning in Andalusia

For the development and enforcement of the powers conferred by Article 13 of the Statute of Autonomy of 1981, the Statistics Act attributed the Institute of Statistics of Andalusia, among others, jurisdiction for developing the Draft Plan of the Statistical Plan and annual statistical programmes which would develop the Plan.

For this reason, during 1992 work was carried out on developing the first Statistical Plan of Andalusia, as noted, it was finally approved by Parliament in June 1993. The annual statistical programmes, in turn, provide a greater level of specificity with respect to the Plan, specifying the activities that are carried out each year and allowing the inclusion of activities not considered during its preparation, following criteria of opportunity or urgency.

The first statistical plan was developed gradually trying to define and generate the main statistical activities that should be undertaken by all statistical agencies and units of Andalusia, but this order was not limited to a rigid catalog of statistics but established a list of objectives to be reached during the development of the Plan. The overall objectives were:

- Structuring the Statistical System of Andalusia.
- Promotion of instrumental activities that ensure the quality (training of specialized personnel and access mechanisms to information).
- Production of reliable statistics at the lowest possible cost, regularly updated, making the most of existing sources, limiting the inconvenience to informants and ensuring statistical confidentiality.

These general objectives are articulated into two specific objectives:

- Information: aimed at meeting the needs for data and statistical results.
- Instrumental: aimed at developing standardized methodological procedures necessary to conduct statistical activities correctly.

While developing the Statistical Plan for Andalusia 1993-1996 statistical production of theStatistical System of Andalusia focused on three main areas: economic, social and demographic statistics. These were complemented by the inclusion of a fourth area, of lower production volume, devoted to Summary statistics.

Meanwhile, the various annual programmes to develop the Plan included another important set of statistical activities. This can be highlighted, in the economic area, agricultural statistics, offering an overview of the sector as well as statistics on other important sectors such as industry, tourism, commerce or transport. In the social area information was significantly expanded on different subareas such as the environment, health, social and labour market, education or welfare and quality of life.

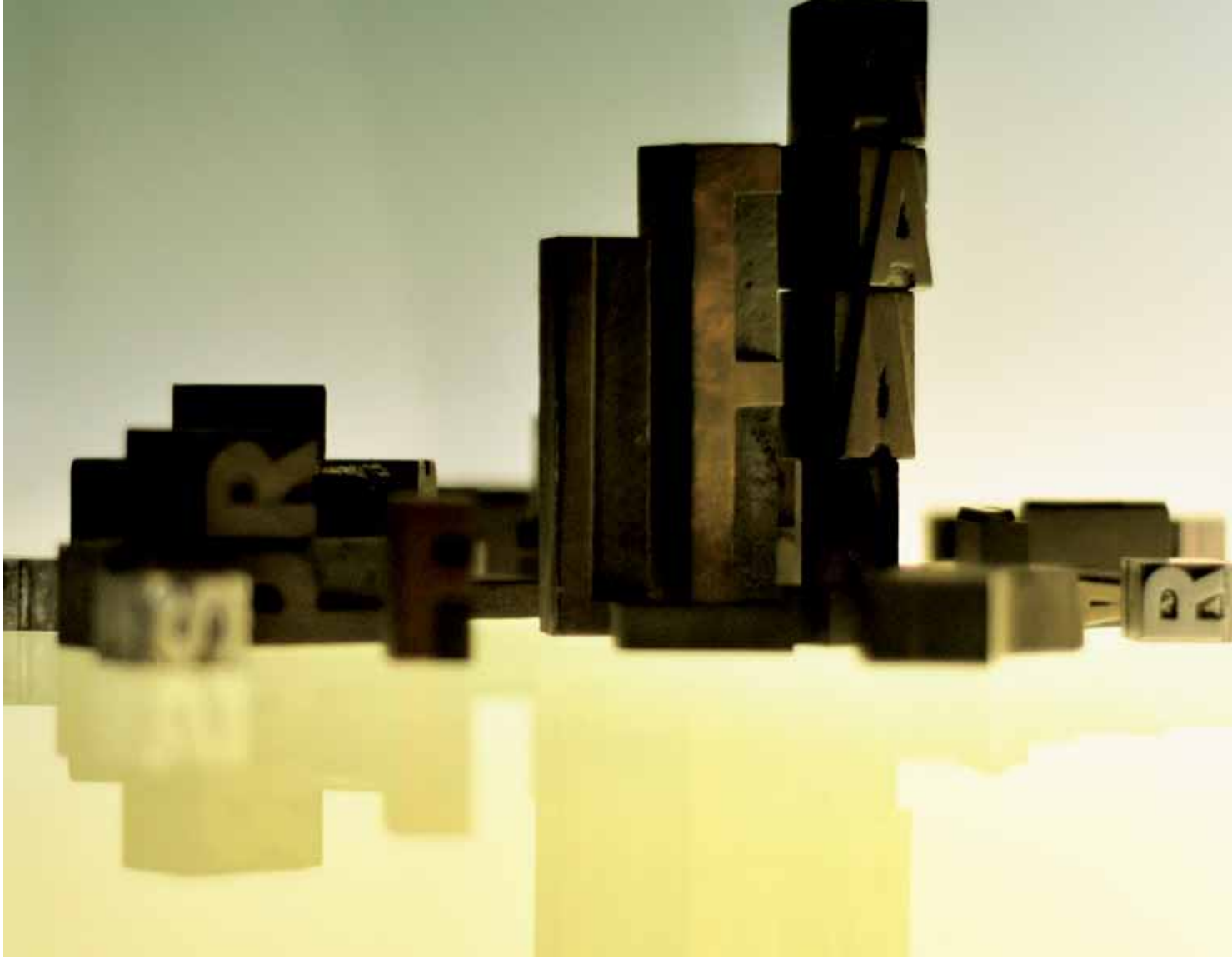

Photo: Antonio Gaga

The first Plan determined the form and content of the work of employees of the Statistical System, and had a very positive effect on the organization of statistical activities. In addition, it provided an initial identification of requirements and made clear the need to implement new mechanisms for coordination, communication and integration supported by a decentralized statistical system.

The Statistical Plan of Andalusia 1998-2001 marked the second period of planning public statistical activities in Andalusia. This plan, through a model of management by objectives, pursued the development and consolidation of the Statistical System of Andalusia as a general objective. For its achievement a series of specific information, organizational and instrumental aims were established through detailed specification of concrete goals to be achieved.

The most noteworthy aspects of this Plan were:

- The inclusion of three types of goals: information, organization and instrumental.
- The addition of new lines of research such as Andalusia Regional Accounting and business statistics, household and family statistics or those relating to the social and economic situation of youth and women.
- The creation of a new area dedicated to the Environment.

The goals of statistical information are supplemented by those of organization. In this area the gradual configuration and creation of network points of Statistical Information was highlighted: small provincial statistical offices open to the public, manned by qualified personnel and equipped with the necessary resources to offer personalized information on provincial and regional statistics.

The instrumental goals set by key issues within the field of public statistics were implemented by developing strategic plans for the dissemination of statistics; specialized training and professional development, statistical research, standardization, homogeneity and comparability of statistical information; computer structuring of the statistical and information systems, and territorial referencing of statistical information.

In developing the Statistical Plan for Andalusia 1998-2001, for statistics production conducted in this period we should highlight:

- In the economic area, the regional accounting study, both from the structural and conjunctural standpoint, developing business competitiveness indicators, the study of sectoral economic accounts, such as tourism satellite accounts, industrial development, the business barometer, or business demographics.
- In the social area, extending through activities such as statistics for early detection of breast cancer, indicators for college education, social exclusion, and the economic and social situation of women or youth, reflecting the social reality of Andalusia.
- In the demographic area, the effort to collect historical data sources on the demographic situation of Andalusia, as a result of which the activity "A Century of demography in Andalusia." was undertaken.
- Consolidating the environmental area by performing activities such as environmental indicators, statistics on biological balances: pests and diseases, environmental volunteer projects or environmental education activities.

The Statistical Plan for Andalusia 2003-2006, which represents, as the third period of statistical planning in Andalusia, a continuity in all aspects considered essential in the development of the previous Plan and , on the other hand, a change in the realization of the development and execution of statistical activities provided for therein, by using a planning model based on the list of activities to be developed within the period of the Plan, unlike the previous design plans in which content guidance took priority.

In terms of statistical production, the main changes included in this Plan were statistics on the study of Families and Households, development and consolidation of the Economic Accounts of Andalusia and the strengthening of general tools and methodologies, such as the Population Register and the System of Population Projections.

The Statistical Plan for Andalusia 2007-2010, approved unanimously by all political groups in Parliament, represents, as well as the consolidation of the services that the Statistical System of Andalusia has been providing, a firm commitment to meet new information needs arising from the socio-economic evolution of Andalusia. The preparation process of the Plan 2007-2010 is based on participation; this has enabled the Plan to be the result of contributions from a large group of experts, institutional representatives, social agents and citizen groups.

Initially the end of the validity of the Plan was 31December, 2010, although the law 4/ 2007 in its third final provision stated that this effect could be modified to achieve alignment with the European statistical plans. Therefore, Law 11/2010 on fiscal measures to reduce the budget deficit and sustainability (passed by the Parliament of Andalusia on November 24th, 2010) has extended the term of the Plan until December 31st, 2012, being called Statistical Plan for Andalusia 2007-2012.

One of the principles of the plan is to use the best technology available at all times to encourage the dissemination and comprehension of the statistical information. To do this, one of the current lines of work is to adapt the information to individual user profiles. Arguably, the focus of the Plan concentrates on the demand side of statistical information. The relevant feature is the need for information, as the offer representing the results of statistical information has value only to the extent that it is useful to society. The use of everyday language for information needs and not the more technical of statistical operations enables participation, consultation and enriches public debate in all phases of the development, implementation and subsequent evaluation of the Plan.

The Statistical Plan 2007-2012, highlights five areas for action, selected for their special importance for social and economic development in Andalusia:

- Immigration.
- Innovation and enterprise.
- Quality of education.
- Economic situation.
- Culture

On the other hand, there are three perspectives that are being systematically integrated into all information emanating from the Statistical System of Andalusia:

- Territory
- Sustainability
- And gender

Another issue to be highlighted is that Andalusia is one of the first regions in Europe that assumes unreservedly the Code of Practice on statistics adopted by the European Union, so that its enforcement is guaranteed by law.

4. Conclusions

Many social phenomena are measured by the Statistical System of Andalusia. This journal shows how this measurement helps us to understand many aspects of such fundamental issues as population, households and families, migration, housing or the environment and sustainability.

The scientific and technological development has provided dramatically improved means of extraction, processing and transmission of information, which has caused the volume of accessible data to grow at a pace unimaginable just a few decades ago, to the point that today, after a short period in which the present society was called the information society we talk increasingly of the "Knowledge Society".

The level of development of a country can be measured by the quality of the statistics it produces.

In this new knowledge society, the fundamental factors that define economic progress have evolved to the point that today the key factors are: what is known, how what is known is used and the ability to increase knowledge and transfer it both to the productive system and society as a whole.

These characteristics of society nowadays make official statistical activity a task of strategic importance to the point that the level of development of a country can be measured by the quality of the statistics it produces.

The assessment of regional statistics, after two decades of operation, is really positive because the main beneficiaries are the users; today they have much more information, not only in quantity but in quality. And this is the result of the Andalusian Administration's continued cooperation with the universities of Andalusia and research centres, through partnership agreements. This cooperation has led researchers and practitioners and statistics producers to join forces to enhance and progressively harmonize the methods and indicators, so that by being able to collate, cross reference and extrapolate the figures from one to another context, it is possible to obtain a rigorous and thorough and not impressionistic or ideological knowledge of almost every aspect of the Andalusian reality. ■

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Information on the plans and statistical programmes and their evaluation (http://www.juntadeandalucia.es/institutodeestadistica/ieagen/sea/planificacion/planificacion.htm).

20 YEARS OF STATISTICAL DISSEMINATION

On a date in the summer of 1989 that I cannot now remember, I was appointed INE deputy director responsible for the dissemination of statistics, and until May 2009 I was Eurostat responsible for dissemination, IT and methodology. Twenty years in which, albeit intermittently, I have been in charge of dissemination in two different organizations. Needless to say, in that period distribution has changed dramatically. I will explain in these lines that these changes are due to two main vectors. One, the purpose and two, technology. It could be argued that these two vectors are closely related, but I prefer to study them separately for greater clarity.

In the nineties many statistical offices were asking three fundamental questions: What information is disseminated, to whom and under what conditions. And they started to answer that the information had to be made, as far as possible public, the data had to be widely accessible to society as a whole. And a little later, they also gradually came to the conclusion that it should be provided free of charge. The National Statistics Institute- INE- started to provide free access to its databases around 1994. And it did so experimentally, through the first internet portal, with the dual aim of avoiding the risk of claims in case of malfunction and to promote its use beyond the public administration. It never reversed that decision. Eurostat adopted the same principle of free access ten years later.

This open idea of dissemination influenced some pioneering countries. I remember a seminal article by Ivan Felleghi, then general director of Statistics Canada, which introduced the "virtuous circle" of statistical information: the more users that have access to greater amounts of information the more society benefits from these data, the prestige of the Statistical Office increases, the responses from the reporting units are more comprehensive and the quality of the figures the office produces and supplies to its growing user community increases.

Some time later, in the new century, there was a further important step in dissemination of anonymized micro-data files to researchers. The goal was the same: to try to maximize the available information, although in this case, protection of confidentiality of informants made it necessary to restrict users and establish limitations on its use.

And this access to all users has become indiscriminate: everything for everyone and all at once. The principles of impartiality and independence set up in the Code of Practice of European Statistics have recently been adopted by all EU statistics offices.

But all this would not have been possible without the technological evolution. In 1989, the INE produced per year over three hundred books, a figure that doubled in a census year. Three years later, we opened the Internet site and started to allow access to the database. And the 1991 Population Census was distributed on CD-ROM containing information on all municipalities and census tracts in large cities. At that time we estimated that this information would have occupied, if printed, five hundred thousand pages.

Gradually the electronic publications began replacing printed publications. In a second phase, these electronic publications became applications available on the websites including statistical search functions and graphic representation. Statistical books (called number cemeteries, years ago) have not disappeared completely, but almost. Eurostat published in 2005 about fifty, the publishing programme of 2011 provides for four.

In parallel, publication times have been greatly reduced since the less automatic stages, such as printing, have disappeared and the production processes of figures (capture, validation, aggregation, analysis ...) are benefiting from advances in computing. Today's users have access to more data, much earlier and simultaneously.

And how will the dissemination develop in the coming years? Of course it will continue to benefit from technological advances. For example, access to data from mobile devices is now possible and will spread rapidly.

But the great qualitative change will occur when the producers of statistics adopt a standard statistical model. A model that includes structure, size and format features. This will allow Web services to offer figures to applications installed on users' computers without human intervention. Currently seven supranational organizations (UN, OECD, IMF, ECB, World Bank, International Deposit Bank and Eurostat) have teamed up to promote that standard. The SDMX (Statistical Data and Metadata Exchange) has been declared by the United Nations Statistical Commission the standard and is starting to be applied in certain statistical areas. Its prevalence will be key in a new age of dissemination. ■

Pedro Díaz Muñoz
Director of Sectoral and Regional Statistics of Eurostat

Andalusian Statistical information on the **internet**

The creation of the Institute of Statistics of Andalusia coincides with the first full connection to the Internet from Spain which took place in mid-1990 as an experimental service of RedIRIS, at the end of that year, only four centres were interconnected: Fundesco, Department of Telematics Engineering (Madrid Politechnic University), Scientific Computing Centre in Andalusia and CIEMAT (the Research Centre for Energy, Environment and Technology).

Andalusia's active presence in Internet development in Spain was due to the fact that it was the first autonomous community to establish its own computer network, the FADN (Scientific Information Network of Andalusia), created in early 1985 by the Directorate General of Universities and Research and the Regional Government Ministry of Education and Science of Andalusia, which was the pioneer in academic networking, as later would be RedIRIS.

And also in 1990 the advance that is the source of the spectacular spread of the Internet: the World Wide Web took place, allowing users to view pages that contain not only text but images, videos and other multimedia content, and navigate through them using hyperlinks.

When in 1994 the first servers outside academic networks began operating, the Institute of Statistics of Andalusia was one of the first institutions to have a Web page, and in just four years was able to provide extensive information on employment, trade and consumption, foreign trade, transport and communications, basic macro-magnitudes and budgets. Disseminating at municipal level, as well as demographic information, data on electricity consumption, phone lines installed, individuals´ income tax or the amount of investment in industries, while offering the possibility of producing thematic maps for different levels of territorial aggregation.

After a constant evolution during the first decade of the century, the 20 years since the creation of the IEA coincide with a major change in services offered by its Web: the implementation of the Statistical Data Bank of Andalusia that will allow users custom consultations from all available sources, and therefore maximize the statistical information. ■

José Luis Pino Mejías
Professor of Statistics and Research
University of Sevilla.

Current Website of Institute of Statistics of Andalusia

First website of Institute of Statistics of Andalusia

Regional statistics:
the problem of the regionalization of headquarters

If you ask an Andalusian whether the Spanish Petroleum Company SA (CEPSA) is an Andalusian company few would give an affirmative answer. Likewise, it is doubtful that the company would deem itself to be Andalusian. However, from the viewpoint of the regional economy, CEPSA is largely Andalusian. It is true that the refining company is based in Madrid, runs the company from there, pays most of its tax there and has also centralized much of its purchases there... but it is also true that two of its three refineries are in Andalusia and moreover they are much larger than the third, located in Tenerife. Therefore, CEPSA, we would like to reiterate, is largely Andalusian.

But, once we accept the fact, one thing is to assert this and another to put a price on it. Starting with the data of the whole business; if we deduct Tenerife's part and the headquarters the rest will be Andalusian. Sounds easy, but even with the collaboration of the company, which in this case is exemplary, it is not at all. Suppose that accounting services are performed in Madrid, how should we evaluate and assign them, in this case, to our region? There are several possibilities. They could be thought of as exclusively from Madrid and having nothing to do with Andalusian refineries. It is also possible to think, that they are Andalusian because this is where they have the most repercussions. It is also possible to think that it is a service that takes place in Madrid and is exported from there, being imported by the refining sector in Andalusia.

No, the decisions to be made are not simple, nor will one more question escape the reader. If the aspiration is that, in terms of refining, the regional accounts of the Community of Madrid, the Canary Islands and Andalusia, with the Regional Accounts of Spain undertaken by the INE one day become comparable it is worth taking these decisions by mutual agreement between the parties concerned.

But perhaps of all possible cases, transport is even more complicated. Are the ships that cross the strait from Ceuta or from Algeciras? Fifty fifty? Relating to the tax domicile, they may be at the address where tax benefits are greatest, but the most important workshops and most of the staff tend to stay on the peninsula. Therefore, how to proceed? Taxes can stay where they are paid, wages where sailors say they reside, but what about the business benefits? What region is that attributed to?

It is easy to wonder why these decisions are not already covered by a binding methodology. Well, this is partly true, but only partly.

The truth is that existing methodologies are relatively new as they settled in or got started during the Second World War as an US demand on England. The aim was to know Britain's debt limits, hard pressed by war, which accelerated regular estimates of GDP and all its ancillary magnitudes. But as will be appreciated, the natural scope of application of these estimates was and is states, not regions. After the war, several international organizations, some members of the UN and others, as is the case of the current OECD, began to develop different models or accounting systems: National Accounts, Balance of Payments, Input Output Tables, Financial Accounts ... without an adequate coordination between them and always thinking about their application to countries. It was necessary to wait a long time, many years, until 1968 when a global system appeared incorporating almost all the above mentioned accounts. And we have had to wait until now for practically everything to be integrated and comparable, but we continue speaking about data on countries.

In all these systems the references to the regional question is therefore very poor and it can be argued that, in reality, there is still no regional approach wide enough nor within the framework of the accounts of the UN, in the 'System of National Accounts'' nor in European application in the 'European System of Accounts.'' And this, even though the later, in its latest version for 1995, has changed its name to ''European System of National and Regional Accounts in the community.''

Why is there not a more advanced framework for regional accounts? Well, possibly because it has only interested a relatively small group of countries which are perhaps made up of different nations or whatever you prefer to call them.

Of course it is the Spanish situation, or Great Britain with Scotland and Wales, or Canada with Quebec, and so on.

Within the Spanish context, the regional situation is very uneven, but certainly Andalusia, as is widely recognized, is at the forefront. Several reasons explain this fortunate fact. Firstly, it was already making estimates –accounts and tables- from before autonomy. Personal aspirations, the university and the financial support of a bank led to these pioneering experiences. Later, once the Institute of Statistics of Andalusia was created, it wanted to receive this heritage while opting to continue the bonds that have remained exceptionally strong, more than any other autonomy as far as I know. Secondly, thanks to the support of the Junta of Andalusia, which has understood, as has happened in only a few autonomous communities, the importance of statistical information.

In addition, the Institute of Statistics of Andalusia has been characterized for maintaining a immovable interest in coordinating with both the INE and their peers from other Autonomies. And, although informally due to the lack of a legal framework which is necessary, but in a very solid and established way, have formed bonds of work and mutual respect that not long ago seemed a mere utopia. ■

Luis Robles Teigeiro. Professor Applied Economics. University of Malaga.

The Institute of Statistics of Andalusia:

20 years at the service of citizens and the Administration

Rafael Martín de Agar y Valverde
Ex-Director of the Institute of Statistics of Andalusia.
Ex-Director of the Institute of Cartography of Andalusia.
Technical General Secretary of the Regional Government Ministry of Public Works and Housing.

1. Introduction

Twenty years! Twenty years is more than enough time to look back and recap on what has been done, while projecting the future with new goals, new horizons and, ultimately, a new impetus for another 20 year period, that now begins. Therefore, this contribution will have this dual role: to look back at the period travelled especially the origins and early stages, and a second part, looking forward, to the challenges that could be incorporated into the future agenda of the Institute of Statistics.

Obviously we do not intend to carry out, retrospectively, a rigorous and comprehensive tour of what has been done in 20 years: we do not have the memory, or the space, or logical distance from the Institute of Statistics of Andalusia (IEA) over much of this period, to allow it. We will just try to outline some milestones that may be of interest to share, noting the path of the IEA, its rationale, its conception, its first steps and provide some ideas that could be used in this new stage, as exciting as the previous one. This, from my experience and my vision, which is only one among others more qualified, who make up this monographic number of the journal *"Statistical Information of Andalusia*

2. The initiative

The first question we might ask, looking at the start of the twenty years, is why an Institute of Statistics of Andalusia? Which could be accompanied by many others, such as, what was the point? Was it the right time? Did we have any alternatives? ...

The passage of time has been answering these questions, more emphatically than what was then still a necessary momentum but with logical questions about its scope. In fact, there was a magnificent and highly accredited National Statistics Institute and there was an Autonomic Statistics Service. But neither formula nor both together, allowed us to go on any longer without a proper body to give statistical coverage to the rapidly increasing competences we were taking on in the autonomous region.

In summary, we fulfilled a directive given by the Andalusian government, which was convinced that it was necessary, it was the right time and there were no better alternatives. There was an ambitious gamble: to develop a Statistics Law, developing the provisions of our Autonomous Statute, which would totally organise statistical production and the fundamental guarantees inherent in it, with two basic objectives: to have sufficient, reliable data (economic, demographic or social) for the management of government and make them available to society, and create the Institute as an essential element. We collected internal experiences from both the Junta of Andalusia (some departments, especially Economy, were already elaborating statistics, often sectoral, in their own area and mainly for domestic consumption) and other administrations (mainly other regions) without losing the great reference of the National Statistics Institute, nor forgetting local Andalusian corpo-

rations, nor the scientific and academic world as a great support counselor, consumer and guarantor of the rigor of the statistical production.

In February 1989, following approval of the bill, which took the rest of that year to process, it was sent to the Andalusian Parliament. As mayor improvements it established a third key element of the regional statistical activity: to coordinate the agents and public services involved in statistical production, and enhance the security of statistical confidentiality. The law was passed with broad consensus, November 28, 1989.

Presumably the twenty years and impeccable track record of this Institute have served to calm the unjustified fears and suspicions revealed by some of the amendments presented[1].

3. The first steps (1990-1991)

Looking back, we cannot forget the beginnings of the Institute. We had, it is true, a great organization, approved in Parliament, but nothing else: no headquarters, no budget, no staff, nothing. Not even a logo, in an era in which they proliferated in any organism. We only needed a tremendous illusion, a political momentum that not even the pre-election period cushioned and, above all, the great contribution of those who were helping at this early stage and without who the foundations of the Institute would have been much weaker. From the Regional Government Ministries responsible for its impetus, to the civil servants of the defunct Statistics Service, members of the Andalusian Council of Statistics and many university professors and of course, the constant support of the Regional Government Deputy Minister Alfredo Perez Cano, and his persistent defense of the independence of the IEA. But above all, the main protagonists of the start of the Institute were its first employees, who with enthusiasm and professionalism contributed to getting it under way.

In that biennium, the first decrees were drafted, the initial structure of the Institute was organized, and the basic operating bodies (Andalusian Council of Statistics and Governing Body) were constituted. Moreover we joined and participated actively both in state bodies and in the coordination between regions –Statistics Open Days for Autonomous Communities (JECAS)-(committing ourselves to large national statistical operations, especially in the Census of Population and Housing 1991), we structured the statistical series and devices for public dissemination of statistical results, we brought out a significant first package of publications (the first being emblematic: The Election Results of the 1990 elections) with a very accomplished graphic identity, we articulated the coordinated operation (within the Junta of Andalusia) and cooperatives (with different public and private institutions: Universities, Local Authorities, Unions, Employers, Chambers of Commerce, Eurostat, etc.), we prepared the first Annual Statistics Programme and the project of the first Andalusian Statistical Plan, etc, etc. In a few words we laid the foundations of a building that, day by day, grew in objectives and in response to the expectations created.

4. Another 18 years

Next came various consecutive stages, which could be considered as the first consolidation, and could range from 1992 to mid 1994, a period of full maturity and settling in and consolidation for the Institute, which could include the following two legislatures, and thus reach 2000. By this time the Institute had been assigned to the Regional Government Ministry of Economy and Finance, coexisting with other institutional avatars and had reviewed its course in order to correct some inevitable errors from the start and the second decade, enhancing the previous elements: strength, capacity, potential, credibility, prestige and, above all, the ever essential quality of the IEA: its permanent vocation for public service.

5. The model

We are not going to speak about the model that was conceived, and that after 20 years has proved fully valid nor the **Characteristics of Public Statistics** (technically

1.Among other amendments, a package was presented (confusing the IEA project with a polling firm) that, in general, was not accepted as the whole, " because they not provide the necessary independence to the IEA," another suggested that the IEA was created "... as a technical body under the Parliament of Andalusia ", others stating that" Any statistics, ..., will be available to Members of Parliament of Andalusia ... ', or proposing that "This law does not regulate or protect the surveys and pre-election polls" and a particularly eloquent and meaningless one, which stated (sic) "Until the Parliament of Andalusia appoints the representatives of the Andalusian Council of Statistics, the IEA will not perform any statistical activity."

correct, efficient, planned, multi-thematic, neutral, timely, stable, and respectful of the right to privacy) nor the role of each of the major **statistical agents** (authorities, producers, users and respondents). But I would, at least, like to mention the model of the **Andalusian Statistical System** we chose as the best for Andalusia and which, after analyzing past experiences of different institutions, we believed should respond clearly to the following central points:

- Neutral: it therefore seemed fundamental to defend the idea of "let's agree on methodologies and disagree on valuations ", avoiding making, from the statistical body, any assessment of the results produced.
- Coordinated and distributed: with a central role of the Institute of Statistics, but with relevant work, particularly in sectoral statistics of all the regional government ministries and other autonomous entities, both in production and in the very concept of statistical activities to be developed. The IEA gave, in turn, support, training, planning, etc.., to the whole system.
- Cooperative: the work of the IEA, and the whole Andalusian Statistical System, had to avoid inbreeding, and had to cooperate and promote cooperation with other entities statisticians, especially institutional ones, either the INE (and the whole of the state Statistical System), local government and provincial counterparts in other regions, and so on.

Public statistics are characterized by being technically sound, efficient, planned, multi-thematic, neutral, and respectful of the right to privacy.

- Participatory: it was not considered possible to design and execute all statistical work from the offices; we needed constant contact with the society, with its major partners and leading mediators, for which we designed an Andalusian Statistics Council adequately plural and representative.
- Open to society: one of the main reasons for statistical production was to make it available to society therefore it was necessary to have a dissemination strategy that not only included the final results, but also the different media, facilitating access to them, to value and demystify the negative aspects that sometimes cause so much distrust in government statistics.

In short, we conceived public statistics with a clear vocation to serve society, understood in the dual, and

Photo: Antonio Gaga

complementary meaning: a direct service to multiple users who through numerous channels access and use IEA products (and, in general, those of the Andalusian Statistical System) and an indirect service, contributing to public policies being supported by objective knowledge bases, for which statistical information remains a key element.

6. Current and future challenges: the next decade

Looking forward now, and in order to contribute to the impetus that shapes the agenda of the IEA, I would like to make some proposals that although repeated in other areas are still, in my opinion, fully valid. I will summarize them in two sections, one internal in the field of statistics: to contribute to consolidating a **State Statistical System** and one with a broader or more global gamut: to promote the integration of the Institutes of Statistics and Cartography of Andalusia.

In the first section, and within the constitutional and statutory framework, we must continue adapting to new demands, new user profiles and new technological possibilities within the framework set out in the previous model. To this end, as we proposed several years ago, we should continue to contribute to the formation of a **New Organization**, in which the user, each user, is unique and therefore must receive an individualized response to their demands for information, for which we should consider the following points:

1) There must be a homogeneous, coherent course of action compatible with the different levels of statistical performance from supranational institutions (Eurostat, UN, etc.) to Local Government, through state and regional organization. In this sense, the three basic criteria that should be taken into account are as follows:

a) The INE must ensure consistency of state and international approaches.

b) The Autonomic Office must ensure the coherence of its own proposals and those of local authorities in their field.

c) The axis CENTRAL OFFICE <---> REGIONAL OFFICE must operate with complete harmony and co responsibility as a basic link in the whole system.

2) The former allows the defense of the articulation of a **State Statistical System**, where each level of government participates and contributes to the overall layout, through proper 'harmonization of interests."

3) Within the role that corresponds to each node of the layout, the **Coordination** it develops will have a fundamental value, both internal at that level and the overall coordination with the following levels (top and bottom) of the scheme in which it is found. In this way, the autonomies must defend three basic tasks: **Consolidation** of statistics of common interest, participating in their design, implementation, dissemination ... **Extension** to obtain new products and results of specific statistics, with greater disaggregation, contemplating the regional perspective/uniqueness, re-exploiting records, etc. and **Complementarity**, taking on new statistics, of special regional interest.

The basic idea is that the IEA and its equivalents be involved in the statistical system in the approach and level that best ensure:

- respect for the interest of autonomous statistics,
- lack of duplication,
- the approximation to citizens and local corporations,
- easy access to the projects of the INE, the rest of the Central Government and the European Union and
- IEA's leadership in the Autonomous Statistical System, promoting and coordinating the work of the Regional Government Ministries, ensuring vertical coordination (with the INE, ministries, local authorities and Eurostat) and providing the technical, methodological and training needed to other units in the system.

4) Finally, in this new organization we propose, the scientific world in general should have a essential role much more interrelated and of mutual cooperation with the statistical offices. Specialized scientific support must reside mainly in universities and the more practical aspects in statistical offices. And this division of roles requires clear and stable lines of cooperation.

As to the second section, the possible confluence of Cartography and Statistical fields, I would like to point out the opportunity to not delay this initiative that I

Photo: Javier Andrada

have defended for nearly a decade for and that today is, if anything, more valid. We could use all kinds of arguments, starting with their own history, such as:

- the existence for a long time in Spain, and today in many countries, of a Geographical and Statistical Institute,
- the wide and parallel statistical and cartographic activity since the onset of the Junta of Andalusia,
- high compatibility and similarity of the rules governing both activities by the Government of Andalusia, such as the Law on Statistics of Andalusia or the Decree on the Regulation of Cartography of Andalusia as the most significant,
- coordination and cooperation relations in both subjects not only with its state or regional counterparts, but also with Andalusian municipalities and county councils.

Or for **technological** reasons, as:

- increasingly, statistical information needs territorial references as a criterion of disaggregation and as management components for census and statistical results,
- and Geographic Information Systems are enriched with layers of information, particularly statistics, having greatly exceeded the "classical" term "mapping" for "Spatial Information" (today maps are a by-product of Spatial Information).

Or for reasons of **similarity between organisms**, as both:

- manage, multi -purpose, expensive, Andalusian information systems that require technical accuracy, updates and technical expertise,
- require software, hardware and powerful communications that could be shared, at least partially,
- have their public service role as a fundamental constituent,
- produce and guarantee the basic information common to all Andalusia (basic cartography, general statistics, surveys, ...)
- play a horizontal role of coordination of Regional Government Ministries, offer support and cooperation in sectoral information and development of instrumental activities (training, research, scholarships ...).

Or promoting numerous **synergies**, the integration of products and services (internal: to the Junta of Andalusia and external: to the citizens), enriching the final information, drawing together the experiences of each side and increasing the power of the Junta of Andalusia in its relations with third parties (institutions, private entities and citizens).

Efficiency would also be gained, as,

- with the same budgetary effort more and better final products would be obtained,
- joint work would not involve any impairment to area-specific products,
- sharing common infrastructure and experience would save and avoid duplication.

- an agency that unites IEA and ICA, even including their current sizes, would result in an adequately sized and "easily manageable" body,
- it would also have strong complementarity, because both agencies would add products, services, strategies, work plans and experiences,
- and this would lead to an enhancement of results, more common information enriched products, integrated official results, including improved joint projects (e.g. Digital Andalusian Street Map) and, ultimately, better service to the management structure of the government and users and a better image of the Junta of Andalusia.

Advantage would even be taken of, in general, having the same references in the regional government ministries, where those responsible for statistical and geographic information systems usually coincide, so, besides being further proof of the benefits of the confluence statistics-cartography, it would facilitate cooperation with the regional government ministries, would join the "Cartographic Units" and "Statistical Units" set up under their respective rules, would help to complement the statistical or cartographic element of the regional government ministries which only develop one of two and increase the development of those less advanced in both areas.

There is no doubt, and I would not like to ignore it, that this possible integration would have some difficulties, though minor, in relation to the advantages, owing to having different trajectories, structures and attachments, as well as the need to unify external references, but these problems can easily be converted into opportunities.

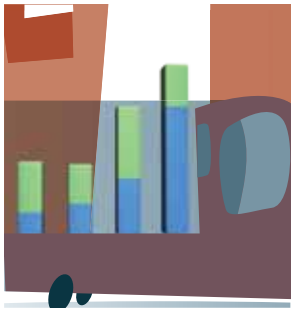
Finally, there are a number of equally important **conjunctural circumstances**, that facilitate and / or recommend this confluence, such as the current economic crisis and strong expenditure restraints which counsels institutions to integrate compatible units, the new location of the IEA in a regional government ministry with an important innovation component (consistent with the new technologies required today for all information management) and being conformed currently the National Cartographic System.

7. In conclusion

We have, in short, a future ahead that is emerging as a challenge, necessarily new and possible, given all the changes experienced in the immediate past. And this challenge will succeed provided that, once again, we assume that this is a commitment for everyone and I hope that everyone gets involved actively (not passively) in this change that, to a large extent, will affect our work, our information possibilities, and ultimately, make It possible to have resolved the need for availability of what for some is the end product and for others the raw material of their work:

Georeferenced Statistics and Information. And with that, continue providing a better service to the Andalusians and demonstrating our commitment to a global project that transcends our borders. ■

	President	Regional Government Ministry	Incumbent RGM	Assigned to	Incumbent	Incumbent Direction IEA
February 90	José Rodríguez de la Borbolla y Camoyán	Presidency	Gaspar Zarrías Arévalo	Vice-RGM	Alfredo Pérez Cano	Rafael Martín de Agar
May 90	Manuel Cháves González		Concepción Gutiérrez Castillo			
August 94		Economy and the Treasury	Magdalena Álvarez Arza	General-Secretary of Economy	Juan Antonio Cortecero Montijano	Gaspar Llanes Díaz-Salazar
September 96						
May 00					Antonio Ávila Cano	Isabel Bozzino Barbudo
January 02						
February 04			José Salgueiro Carmona			
May 04			José Antonio Griñán Martínez			Juan Antonio Fernández Cordón
May 08						Patricia Eguilior Arranz
April 09	José Antonio Griñán Martínez		Carmen Martínez Aguayo		Manuel Recio Menéndez	
January 10						Pedro Gracia Vitoria
April 10		Economy, Innovation and Science	Antonio Ávila Cano		Gaspar Llanes Díaz-Salazar	Ignacio Pozuelo Meño



Regional statistics in Spain and institutional collaboration in official statistics

Jaume García Villar
President of the National Statistics Institute (INE)

Alex Costa Sáenz de San Pedro
Director General of Planning, Coordination and Dissemination of Statistics of the INE

The legal framework of official regional statistics in Spain is set by the provisions of the Spanish Constitution in the respective Statutes of Autonomy and the Law on Public Statistics. The Constitution establishes that "the Central Government has exclusive jurisdiction over statistics for state purposes" (Article 149.1.31). For its part, the Statutes of Autonomy states that regional administrations are also exclusively competent for statistical purpose s of the Autonomous Community.

The Law on Public Statistics clarifies that "the Constitution does not introduce specific limits on state statistical activities." The Law also states that, in statistics, a distinction cannot be made between basic aspects of development or implementation. Therefore, state statistical activity is not limited to regulatory or coordination aspects, but includes all phases of the elaboration of statistics. In this context, the definition of statistics for state purposes offered by the Law on Public Statistics is purely formal: statistics for state purposes are all statistics included in the National Statistical Plan (NSP).

The policy framework described above leads to a logical convergence of interests between official statistics of the General State Administration (GSA) and official statistics of the Autonomous Communities (ACS). This convergence leads, in turn, to the need for effective coordination. To this end, the same law created a permanent body for coordination and cooperation: the Interregional Committee of Statistics (ICS)..

This framework allows us to imagine not only an

Logical convergence of interest between the official statistics of the General State Administration and the Autonomous Communities.

utterly negative scenario (with duplication of surveys, wars of numbers and, general inefficiency in the use of public resources for statistics) but also a positive scenario, where regional statistics is a strong point of official statistics in our country. Naturally, this second scenario is the one that concerns us all and is precisely the one being developed today.

In shaping this positive scenario of collaboration there are, in our opinion, two key elements. The former is more instrumental and related to the present or short term: the structuring of a coherent and complete system of work groups among the statisticians of the GSA and ACS. The second is more intangible and is in the process of development: the complementarity of statistical activities carried out by the Administration and the ACS.

Starting with the first element mentioned, there is no doubt that the identification of concrete, efficient and useful cooperation between administrations must be the result of consistent methodological and opera-

tional formulations, which must develop into technical working groups. This is experienced every day, under the European Statistical System: a different complex reality, but which has been able to generate positive results, both in European and Spanish statistics in recent years.

The operating capacity of the Interterritorial Committee of Statistics (ICS) as an organ of coordination and cooperation between the GSA and ACS in official statistics requires the development of a complete and proportionate system of working groups. In fact, in 2009, within the framework of the Regional Statistics Forum (RSF) as part of the ICS, five working groups were created to address cross-cutting issues such as the inventory of statistical operations, directories, standards, information collection and dissemination of statistics.

It seems therefore appropriate to extend this structure of cooperation and coordination with the creation, within the framework of the ICS, of a system of thematic working groups on specialized statistics to address the areas of Business Statistics, Socio-Demographic Statistics and Economic Accounts.

The most positive element of the collaboration between the GSA and ACS: the complementarity of statistical activities carried out in both areas..

Despite the importance of this system of working groups, we believe the most positive element of the collaboration between the AGS and ACS is more intangible: the complementarity of statistical activities carried out in both areas.

To understand clearly the meaning of this complementarity we should answer the following questions:

1) Which regional statistics are of interest of the state??

2) How do regional statistics complement state statistics?

Currently, since 2009, there is an additional element that specifies even better that non thematic limitation of State statistics which is referred to so precisely in the Law on Public Statistics: The European Statistics Law adopted as Regulation 223/2009 of the European Parliament and the Council. From this Regulation it was established that the national statistical institutes as national statistical authorities assume the responsibility for coordinating, developing, producing and disseminating European statistics. Consequently, those statistics that are (or will be) regulated in the European Statistical System, are automatically 'of interest to the State''. To this particular set of statistics regulated at European level is added the set of statistics that are relevant to state policies or for the GSA competences, including harmonized statistics on the ACS.

The abovementioned second question should be answered based on the idea that GSA produces harmonized, multi-thematic regional statistics for the ACS. In view of the idea that complementarity includes many different activities, a non exhaustive schematic relationship is as follows:

1) Dissemination and analysis of results: the re-dissemination of harmonized statistics, including information not provided as standard state statistics, with analysis of these results for the region.

2) Constructive Review: activity managed from the regions towards harmonized GSA statistics to improve information quality. Constructive analysis can address both the outcomes and processes of consolidated statistics and the implementation of new projects and should be channeled through the working groups already referred to.

3) Reinforcement of NSP operations: application of different statistical developments, such as the application of estimates supported by models, small area estimation techniques, operations under a dual framework or, finally, implementation of harmonized mimetic operations of the NSP (equivalent to the expansion of samples), all to promote the thematic, territorial and temporal coverage of NSP operations.

4) Collaboration in production: an activity that is already carried out by the INE and the ACs in Vital Statistics, this is a model that can be very useful, particularly when the baseline information stems from certain administrative records.

We believe that if we address appropriately the partnership challenges between our two administrations, perfectly possible in the current legal framework, we can make regional statistics one of the strengths of official statistics in our country. ■

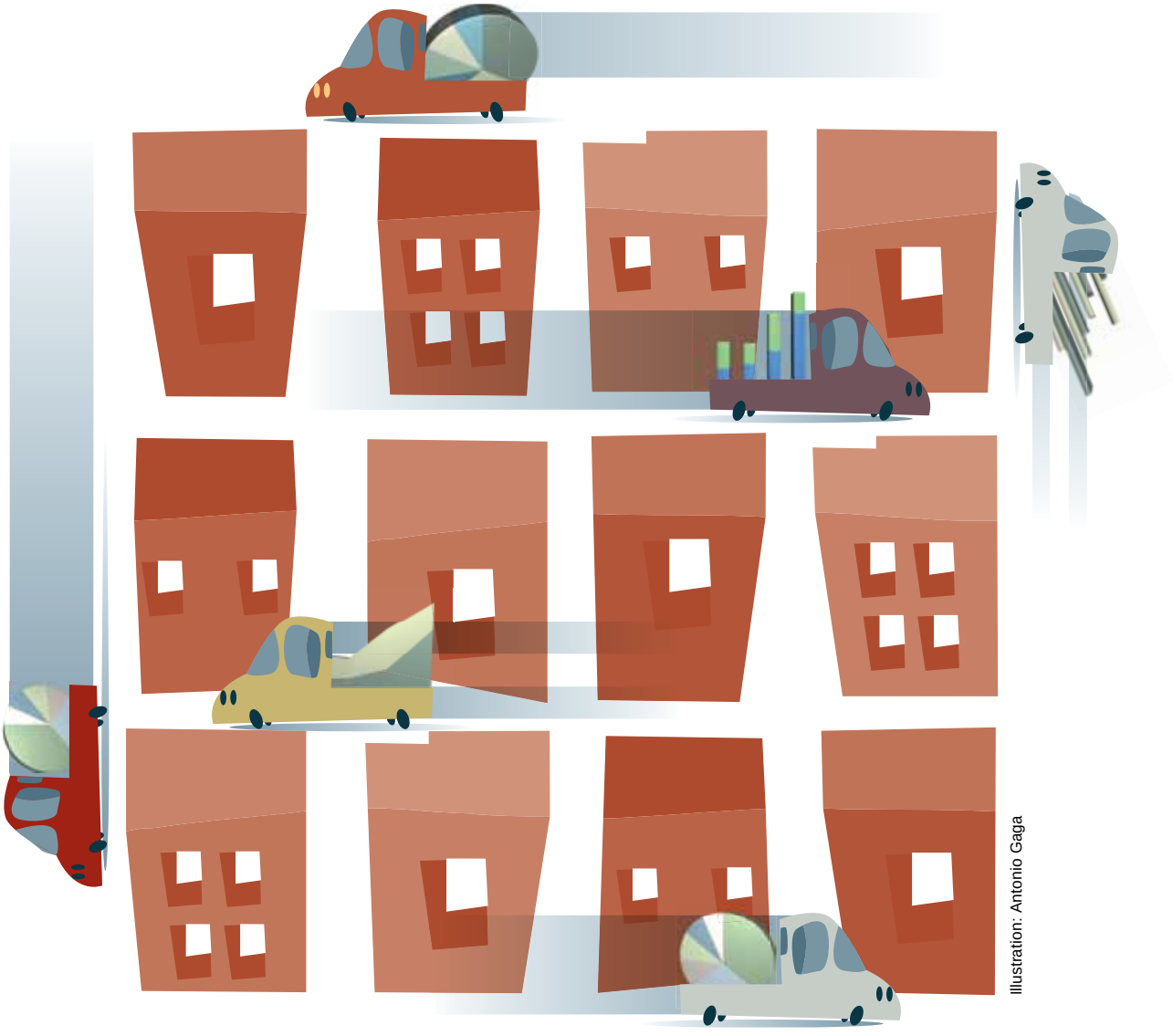


Illustration: Antonio Gaga

The economy

Andalusia's GDP has grown in volume by 71.3% in 20 years, reaching 146.622 million euros in 2009 and the GDP per capita by 45% to 17.485 euros.

GVA and employment evolution by sector

	GVA (%)		Employment (%)	
	1990	2009	1990	2009
Agriculture	8.5	4.6	15.4	7.4
Industry and Energy	23.1	10,4	15,4	9.4
Construction	11.4	11.4	12.3	9.8
Services	57.0	73.6	56.9	73.4

In 2009 there were 508.285 businesses in Andalusia, 163.865 more than in 2000.

The level of openness (exports plus imports relative to GDP) of the Andalusian economy fell from 61% in 1990 to 84% of GDP in 2008.

The labour market in Andalusia: 1990-2009

Population aged 16 to 64 years	1990	2009
Thousands of employed persons	1,874.4	2,904.1
Men	1,364.2	1,700.3
Women	510.2	1,203.8
Total activity rate (%)	57.4	70.4
Men	78.2	80.1
Women	36.6	60.4
Total employment rate (%)	42.6	52.5
Men	62.1	60.8
Women	23.2	44.0
Total unemployment rate (%)	25.7	25.4
Men	20.5	24.1
Women	36.7	27.2
Foreign born people employed (%)	0.2	10.3

Public spending on R&D in Andalusia (as percent of GDP) has exceeded the EU average since 2007; private spending is still a long way back.

In 20 years the number of researchers in Andalusia has risen from 8,828 to 25,097.

The Andalusian economy 1990-2010.

Changes in its large numbers

Francisco Villalba Cabello y Esperanza Nieto Lobo
Economic analysts of Andalusia

1. Introductión

The twentieth anniversary of the Institute of Statistics of Andalusia is a good reason to review the economic trajectory of the autonomous community of Andalusia over the last twenty years. Undoubtedly, in these two decades - the period between 1990 and 2010 - the regional economy has experienced remarkable growth and development, measured as the growth of the main macroeconomic aggregates (GDP or GDP per capita) while experiencing significant social changes, most especially related to the development of new technologies and demographic changes.

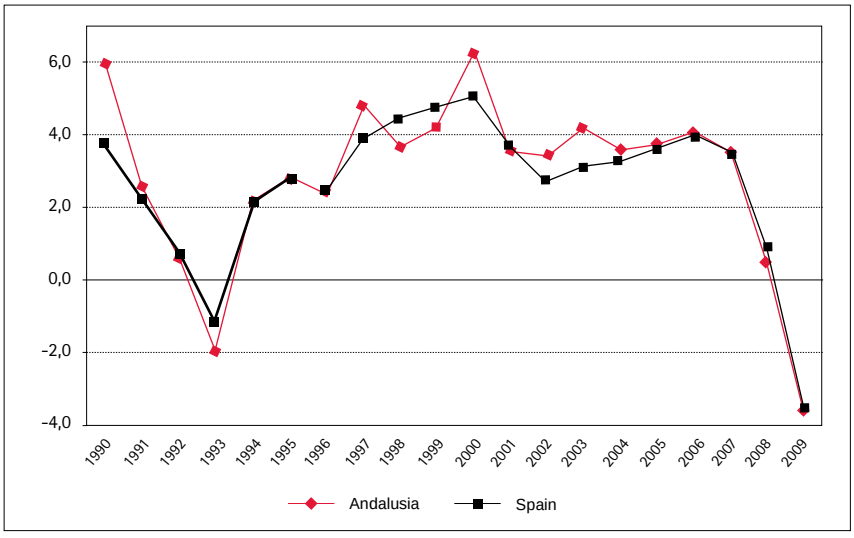
But our focus in this article, is not aimed at painting a detailed portrait of the socioeconomic evolution of Andalusia in the past two decades, but it seemed more appropriate to pay special attention to those differentiating aspects of the regional economy with regard to Spain, as they will help us better understand the structural features as well as the reasons for progress in some macro-aggregates and the persistent behaviour of others. This perspective will allow us to look closer at some of the difficulties currently facing the regional economy. However, this review does not intend to neglect the position of some key indicators that, in our view, outline the economic outlook in comparison with the early nineties to be able to gauge the progress made.

Moreover, there are two underlying issues in this journey through the macro figures of the last two decades of regional economy. One is related to the behaviour of the business cycle during the period analyzed which has affected the main macroeconomic aggregates, as the phase of sustained expansion that the Andalusian and Spanish economies experienced between 1994 and 2008 does not exactly match the two decades,. This fact is manifest at the end of the period observed, seeing as most of the statistical information available is for 2009, when the contraction has possibly been the most severe in seven decades. On the other hand, the dynamism observed in this stage is influenced by the stability of monetary and fiscal policies brought about by the incorporation of Spain into the EU (in 1986), the implementation of the convergence criteria (Maastricht Treaty) and the effects of adopting the common currency, the euro.

With respect to the reality of the figures (based on official sources of the Institute of Statistics of Andalusia (IEA) and the National Statistics Institute (INE) which support our conclusion that the first point to note is the high degree of similarity in the cyclical behaviour of the Andalusian and Spanish economies in that period. Through the growth rate of GDP, in both places, we can see the synchrony and the similarity in the interannual variation rates, that the balance of the period (1990-2009) was slightly higher at the regional level (2. 9% versus 2.6% of the national, in real terms).

Figure 1. Comparative Economic Growth Andalusia-Spain

(Inter-annual variation rate in %)



Source: National Accounts of Spain and Regional Accounts in Spain, INE

This very similar increase in aggregate production, as well as an almost identical evolution in population, explains the scant reduction of the divergence in GDP per capita between Andalusia and Spain. The persistent difference in this quality of life indicator is eloquent, as it has reduced only slightly over the last twenty years. Furthermore, although it is difficult to obtain comparable information for the entire analysis period of this magnitude in the EU (due to consecutive enlargements) it does not seem unfounded to warn that the convergence process has slowed in the last two years and that the balance of these two decades, the shortening of the differences has been limited and less than desirable. According to Eurostat, in 2007, GDP per capita of Andalusia was 81% of GDP in the EU-27, while in Spain it was 100%. In the mid-nineties, these percentages were 67 and 85% respectively, demonstrating that the narrowing between Andalusia and Spain has been very limited. The greatest rate of expansion of the Andalusian and Spanish economies since the mid-nineties to 2007, and the lesser impact on the domestic side of the 2001 European slowdown have enabled the reduction of the gap between our income level with respect to that of the surrounding countries, but not the regional with the national average.

A possible explanation for the stark differences in reduction of per capita GDP between Andalusia and Spain, also derived from the similarity in the growth path (profile of GDP variation rates) and common demographic traits rests -being the hypothesis of other studies- on the possibility that both economies are close to their long-term growth paths, making our profile or slope identical, but at different levels. To verify this hypothesis we would have to know the capital stock of each economy and check if the growth rates of technology in both economies either match or closely resemble one another, as would be expected in a situation of close to steady balance.

As performing this analysis, inherent in growth accounting, required starting from the aggregate production function of the economy, and that this research exceeds the scope of this article, we will focus on the simple decomposition of output per capita and growth rate, taking into account only the influence of demographics and the labour factor. This approach, to which the second section of this article is dedicated, provides information in terms of productivity, but the fact that it refers to labour productivity and not Total Factor Productivity (which would require capital estimates in combination

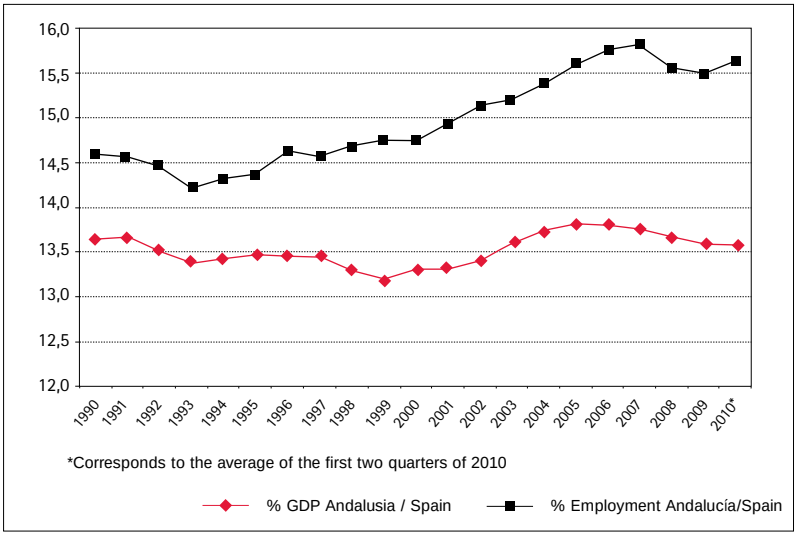
with the labour factor) must be taken into account. The third section also analyzed the GVA and employment in key economic sectors in the period 1990-2009, to test for differences in the Andalusian productive structure in recent years, and its comparison with Spain, by obtaining specialization indexes and sectoral productivity. Finally, in the fourth section, we review other relevant indicators of the regional economic situation which allow us, in conclusion, to point out the outstanding or unresolved issues, as well as new economic challenges that require continuous adaptation to a complex and globalized environment.

2. Regional GDP and employment growth in these two decades

The evolution of the main aggregates for our analysis: GDP and employment, within the national context, over the past two decades, indicates that the proportion of regional GDP on the national aggregate has been very stable. In the early nineties, the production value of Andalusia represented around 13.6% of the national total, and in 2009 (INE Regional Accounting estimates) held a similar share. On the average of the period, this ratio would have been 13.5%, highlighting the low dispersion experienced in the last two decades. In 2005, regional GDP reached the highest significance in Spain, with 13.8%, while 1999 would have been the lowest weight (13.2%). Undoubtedly this low variation is due to the symmetry in the behaviour of GDP in either space, abovementioned, and the short differences in growth rates.

However, this profile is not as flat when we analyze the significance of regional employment (employed population, according to the Economically Active Population Survey, INE) in the whole of Spain, because the differences were more significant, with an upward tendency in the average of the period. Thus, while in 1990 the employed population in Andalusia accounted for 14.6%, in recent years this ratio has exceeded 15.8%. In other words, not only the presence of labour as a factor of production in the regional economy was higher than GDP (13.6%) in the early nineties, but this increased use of labour has been reinforced in the period analyzed. As we will see later, the consequences of this dichotomy will be reflected in terms of lower productivity (labour) in Andalusia compared with the Spanish average.

Figure 2. GDP and Employment in Andalusia and in Spain (Percent)

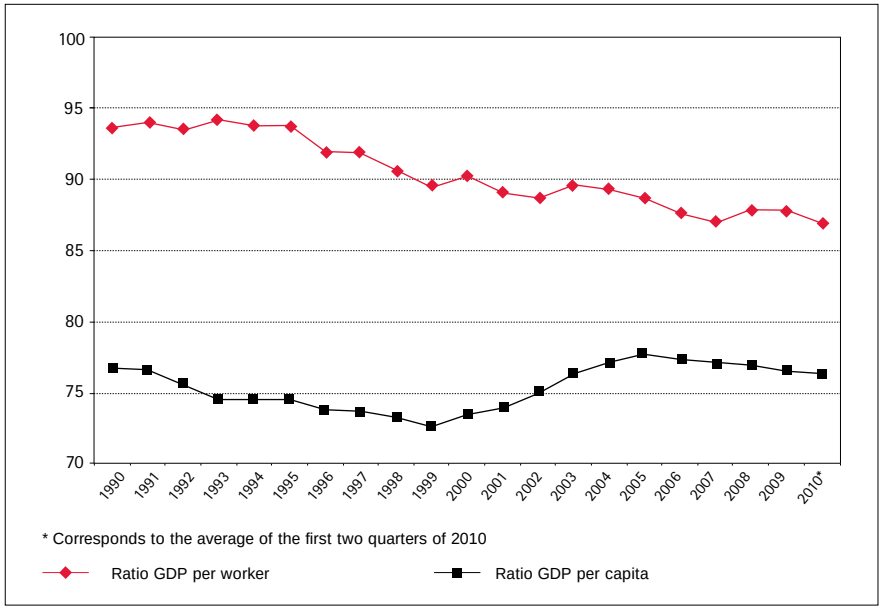


Source: National Accounts of Spain and Regional Accounts of Spain, INE.

The differential behaviour of employment in the Andalusian economy must not be overlooked, especially, if it is considered with respect to the demographic trends observed in the last two decades. In this sense, as stated above, population growth in Andalusia and Spain has been very similar in the period, albeit with important qualitative differences (see the table in the last paragraph). The integration of these evolutionary traits -similarities in the path of the total population and higher employment growth in Andalusia- is offered in the following graph (3), representing the behaviour over time of GDP ratios or quotients per person employed and GDP per capita in Andalusia over Spain. First, it should be noted that both the ratio of output per capita (GDP / population) and of GDP per person employed shows a disadvantaged regional position in respect of the national average in the early nineties. In the case of GDP per capita, Andalusia represents 76.7% of the national figure, while in the case of GDP per person employed it was 93.6%, also below the Spanish average although the gap is less relevant.

Second, it is remarkable that the differential with Spain in terms of GDP per capita has remained relatively stable in the balance of the two decades. In a first stage a certain enlargement was observed in the differences, then there were a few years of correction, but more recently it has been losing intensity, again, to tend towards stagnation in the convergence process. Obviously these slight oscillations correspond to the GDP growth rates, as demographic evolution has followed even more similar patterns in both geographic spaces

Figure 3. Difference in the paths of GDP per capita and GDP per worker
(1:1 ratio Andalusia-Spain)



Source: National Accounts of Spain and Regional Accounts of Spain, INE.

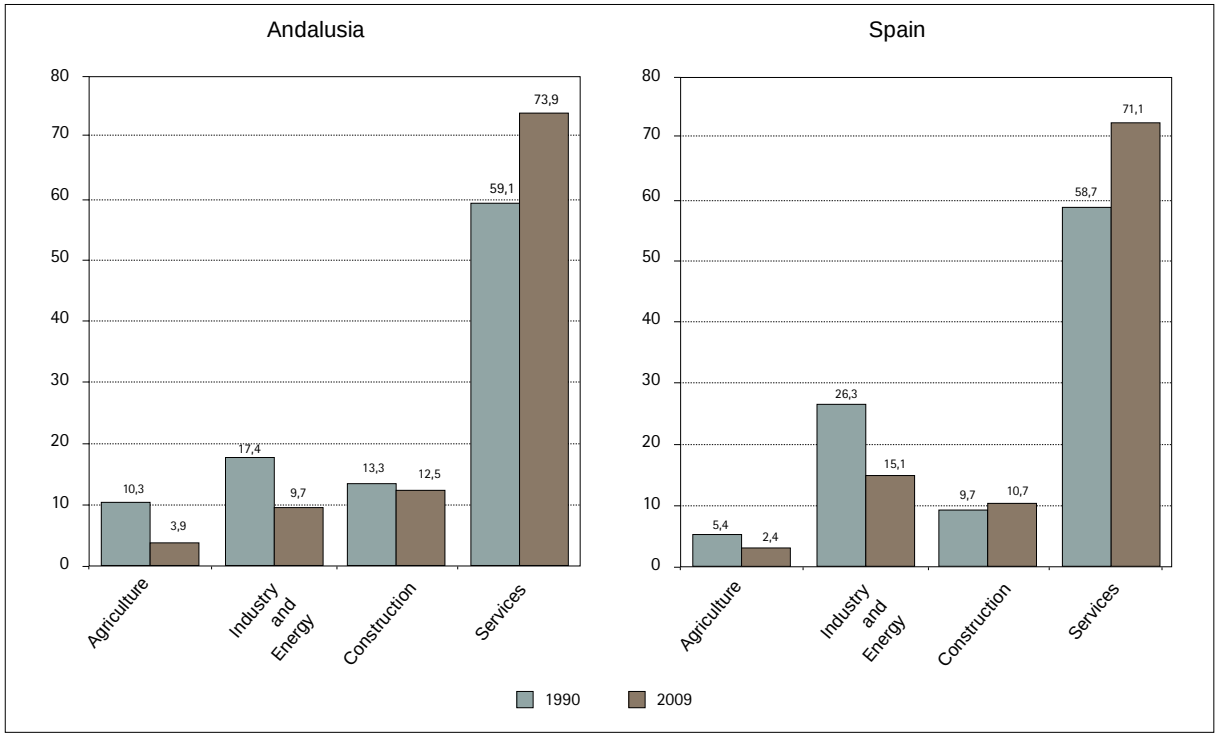
In relation to the trajectory of GDP per employee, a gradual decline in the ratio of Andalusia in relation to Spain is observed, that in agreement with the mimicry in the pace of GDP, underlines the fall in (labour) productivity in Andalusia in relation to Spain in this period. In a first stage, until the mid-nineties, this decline is not seen in regional output per employed person, and from this date this profile is more pronounced, so in 2010 (with data from Economically Active Population Survey on the average of the first quarter), GDP per employee in Andalusia is almost 86.9% of the national average, a decrease of almost 6.7 percentage points in 1990. In

other words, output per worker in Spain has grown faster than in Andalusia (4.4 vs. 4.0 regional).

3. A sectoral analysis of the economy in this period

The analytical approach carried out in the previous section can be completed taking into account changes in output and employment, but from a sectoral perspective. Therefore it is convenient, first, to find out what the regional productive structure was twenty years ago, and check whether there have been differences in this period. Thus, it is possible to check how intense the process of tertiarisation of the Andalusian economy has been (also the Spanish, although slightly less) during this period, to the detriment of the activities of agricultural and industrial sectors.

Figure 4. Distribution of production by sector, 1990-2009. Comparison Andalusia-Spain
(% on total GVA)



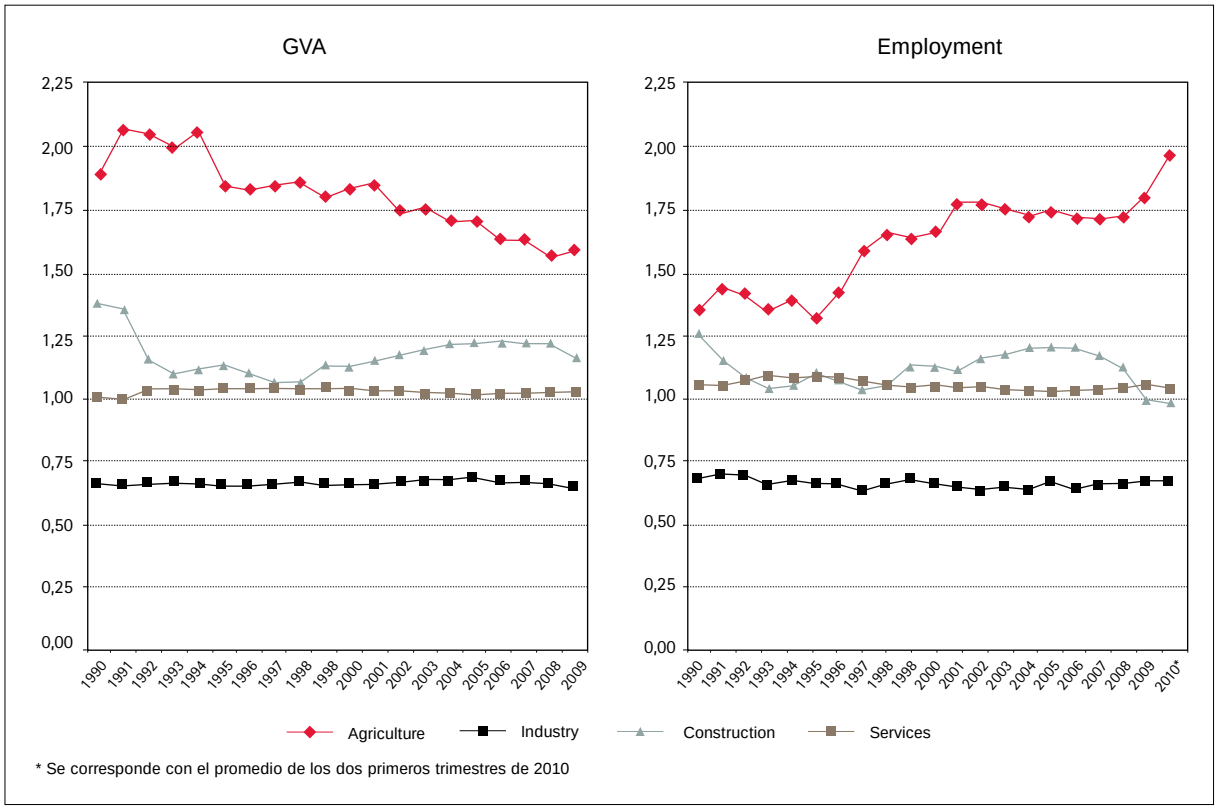
Source: National Accounts of Spain and Regional Accounts of Spain, INE.

In the early nineties, the regional economic activities of agriculture, livestock and fisheries contributed together 10.3% to the total GVA, opposed to only 4% in 2009, according to estimates by the Regional Accounting of Spain (RAS). Industry has also suffered a reduction in these two decades (from 17.4% to 9.7%). By contrast, in the construction sector this temporal comparative would yield a very small variation (less than 1 percentage point (pp)), obscuring the exceptional boom experienced by construction activities in recent years (in 2006, it provided about 15% of regional GVA, 7.6% in 1997). To sum up, the GVA in services has been the great beneficiary of the weight loss of other sectors, gaining, over these twenty years, almost 15 percentage points in its contribution to regional GVA, representing in 2009, according to estimates, 73.9% of the Andalusian economy .

This portrait, although it bears similarities to what happened in the whole of Spain -in regard to loss of relative importance of primary and industrial branches, the boom and subsequent

Figure 5. Regional production specialization

(1:1 ratio Andalusia-Spain)



Source: National Accounts of Spain and Regional Accounts of Spain, INE and IEA.

adjustment of the construction sector, as well as the sustained impulse of GVA generated by the services sector -also shows significant differences, as the starting positions (early nineties) were not identical. To contrast these differences it is possible to use regional productive specialization indexes, both in terms of GVA and employment.

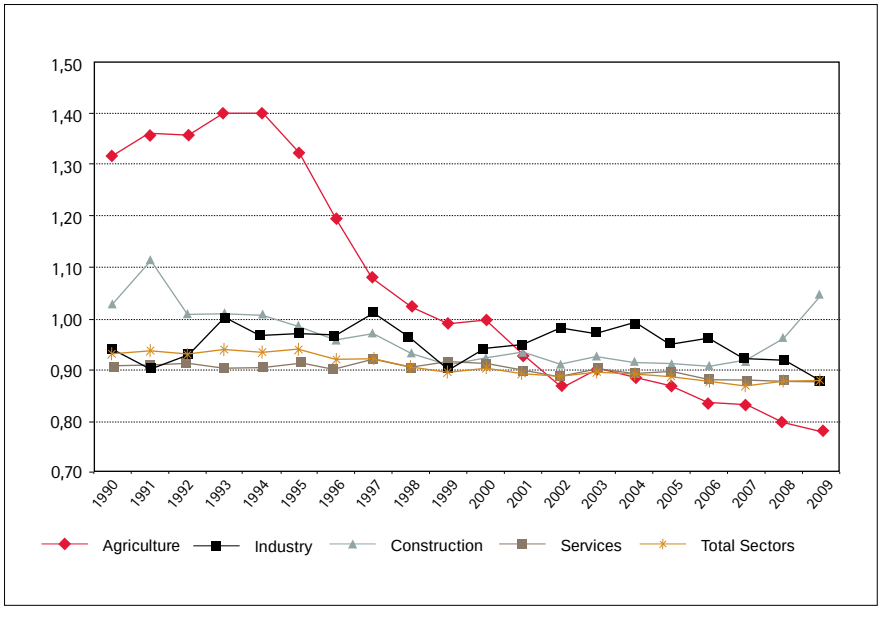
The ratio or relationship between the share of GVA in each regional economic sector and for Spain, clearly identifies those sectors with greater presence in the regional productive structure (which is understood as specialization) that would yield an index value above unit. These would be cases of agriculture, with a greater degree of specialization with respect to Spain (early nineties it reached two and then has been declining), construction and services, as the value of the regional specialization indexes surpass the unit, although very slightly, especially in the services sector. By contrast, the lower relative importance of industrial activities in the regional economy is reflected in the reduced values of specialization rates. In the average of the period, the index shows a value of 0.66, that is, the presence in the regional productive structure of industrial branches is approximately one third lower than the national average, and underlines the persistence throughout the period (1990-2010) for this feature.

Conclusions similar to those of GVA arising from the evolution of regional specialization indexes in employment, noting the obvious significance of the regional agricultural activities in terms of employment (with an average index of 1.59 in the period over

Spain). Also in construction and services, indexes confirm the special establishment of productive employment in these sectors in the Andalusian economy compared with Spain (1.10 and 1.03, respectively, in the average of the two decades analyzed), but with a lower degree of importance than agriculture. Meanwhile, as noted in GVA, industry is set up as a sector with little relevance in employment in Andalusia (0.63 as regards to Spain, on average between 1990 and 2010, three tenths lower than in the value added).

Undoubtedly the most striking aspect in relation to specialization indexes is the behaviour of the agricultural sector, in contrast to the steady path of other productive activities. The low, almost zero, variation in specialization rates in these three sectors (industry, services and construction), without other signs that demonstrate a more dynamic manufacturing sector during the last twenty years confirms the absence of significant structural changes in Andalusia in relation to Spain. In contrast, the degree of significance of these three sectors remained virtually the same as in the early nineties. The only exception to this symmetry is experienced by the agricultural sector, which has lost importance in terms of GVA (evident in the decline in regional specialization index over Spain). By contrast, the agricultural sector has grown in employment in Andalusia compared with the Spanish average (marked by increased job specialization index).

Figure 6. Ratio of Andalusian labour productivity by sector compared to Spain
(1:1 ratio Andalusia-Spain)



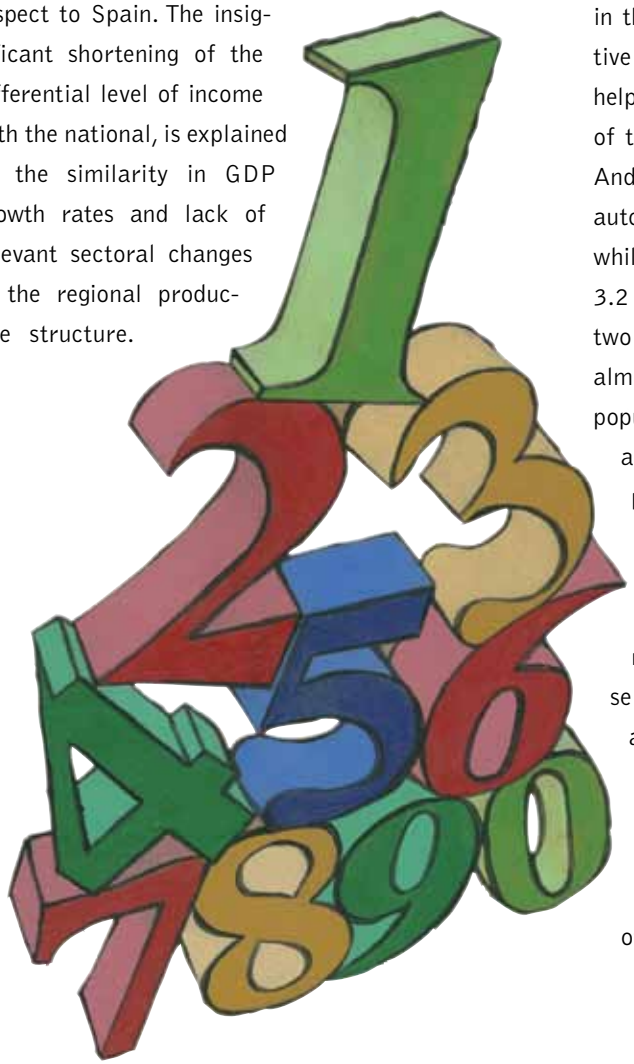
Source: National Accounts of Spain and Regional Accounts of Spain, INE and IEA.

The combination of both behaviours explains the sharp decline in agricultural productivity experienced in Andalusia (Figure 6), in contrast to the more stable or lasting trend of other productive sectors. Indeed, the comparative analysis of regional labour productivity with respect to Spain during the period 1990-2010 reveals the not very advantageous position of Andalusia in all sectors except agriculture, in the nineties, and some years in construction. The value of total productivity (of the labour factor), without distinguishing sectors in the Autonomous Region in 2009 was 88% of the Spanish average, has undergone a decline from 93% in the early nineties. Industry and services, with some fluctuations in the

period, also observed a moderate decrease in productivity, while construction has experienced a recovery on the back of a greater decrease in employment than in production, due to the crisis. However, the most prominent trajectory corresponds to the sharp drop in labour productivity in the regional agricultural sector compared with the Spanish average, exceeding the national (140% in the nineties) and becoming the least productive activity in the regional economy (below 80% of Spain).

4. Highlights and conclusions

The results of the previous sections support the perception that the advancement of regional economy in the period 1990-2010 has been visible in comparison with European standards, but virtua- lly zero with respect to Spain. The insignificant shortening of the differential level of income with the national, is explained by the similarity in GDP growth rates and lack of relevant sectoral changes in the regional productive structure.



Ilustration: B. Moreno

The two most notable aspects relate to the greater growth of employment in Andalusia, which has led to a productivity loss compared with Spain, and the weight reduction of agriculture, in terms of GVA, but not in employment with the consequent productivity loss in the sector. These findings, despite not having information on the provision of other productive factors (physical capital), would indicate a level of aggregate efficiency of the regional economy lower than the nation as a whole, explaining the persistence of inequality in GDP per capita.

The regional labour market has grown by almost a million jobs.

These aspects, along with others, are latent in the picture of the great numbers of the regional economy in the last two decades, which also exhibit other positive traits. In this sense, the size of the labour market helps to understand the social implications the rise of the labour factor has meant in the development of Andalusia. In 1990, the employed population in the autonomous region was less than 1.9 million people, while up to two and half years ago (in 2007) it exceeded 3.2 million persons, so that on the balance over these two decades, the regional labour market has grown by almost a million jobs. This broadening of the employed population has been more evident than in the national, as proof that the average annual growth over the period 1990-2010 has been greater in Andalusia than in Spain (2.13% versus 1.78 %, or 0.35 percentage points difference). Similarly, the incorporation of women into the labour market, as measured by differences in activity rates, the increase in students as well as the use of new technologies and demographic changes (an exceptional increase in foreign population and the rate of ageing) are very instructive socioeconomic changes occurring in these two decades. At the same time, the pattern of growth observed in this period and the absence of structural reforms have led to imbalances and an

increase in consumption to the detriment of investment, slow progress in productivity and competitiveness, foreign trade deficit, insufficient R&D&I), which make up the challenges facing Andalusia today. ■

Table 1 Selected indicators of Andalusia. Comparison 1990-2010

	Andalusia			Spain		
	1990	2010[2]	Variation	1990	2010	Variation
Population (*))	7,100,060	8,353,843	0.82	39,887,140	46,951,532	0.82
% Foreign born population [1]	0.89	8.36	7.47	0.90	12.16	11.26
Ageing index	49.74	89.58	39.84	68.54	106.05	37.51
Dependency ratio	53.47	45.12	-8.35	50.30	47.81	-2.49
Students enrolled in college (*)	160,377	222,672	1.65	1,118,781	1,509,694	1.51
Employed population (employment, in thousands) (**)	1,889.3	2,880.65	2.13	12,955.0	18,435.6	1.78
% Foreign born population employed	0.21	10.30	10.09	0.32	13.95	13.63
% Employed salaried population	74.68	81.73	7.06	74.11	83.02	8.91
Activity rate	48.89	58.29	9.40	50.82	59.94	9.12
Men	68.47	68.18	-0.29	68.45	68.65	0.19
Women	30.38	48.72	18.34	34.27	51.57	17.30
Unemployment rate	25.53	25.35	-0.17	16.23	18.01	1.78
Men	20.40	24.07	3.66	11.85	17.72	5.87
Women	36.44	27.09	-9.35	24.46	18.39	-6.07
GDP per capita (current €) (*)	5,793.3	17,485	5.68	7,555.8	21,582.0	5.39
GDP per worker (current €) (*)	21,770.8	47,762.0	4.01	23,263.6	54,965.1	4.39
Expenditure on R&D/GDP	0.46	1.10	0.64	0.85	1.38	0.53
% Households with Internet access	--	48.40	--	--	54.00	--
% People who use computer	--	49.21	--	--	51.31	--
Foreign trade balance (millions of euros) (*)	-532.54	-3,675.27	10.70	-19,664.82	-50,182.52	5.05
Foreign trade coverage ratio (%)	86.42	79.59	-6.83	63.30	75.92	12.63
Level of external openness (%)	17.77	22.64	4.87	29.03	34.88	5.85

Source: Statistical Institute of Andalusia and INE.

1. The foreign born population refers to 1991, as 1990 data were not available.
2. Most of the indicators refer to 2009. The population data is an advance for 2010, and the working population data are the average of the first two quarters of 2010.

(*) The change is measured in cumulative average annual rate. All other variables are measured in percentage point difference.
(**) The labour market data refer to the population aged 16 and over. The statistical annex contains the stratum corresponding to 16 to 64 years of age.

The insertion of the Andalusian economy in national and international markets

Ilustration: B. Moreno

Using different criteria we can assign a present weight to Andalusia, within the whole of Spain, which reaches 18% share of the total population or of working age (National Statistics Institute, INE; Economically Active Population Survey, EPA). In employment the weight of Andalusia in the national labour market is slightly lower (less than 16%).

However, more than the number of people or employees, the most modern studies by economists point to the importance of human capital, that is, the training and skills of those involved in the production process of a country or region.

A simplified way to measure the preparedness of people is through the average number of years of formal education. According to available estimates, the average for Spain would be close to 10.25 years, for Andalusia it would be slightly lower. It can be inferred from this that the human capital of Andalusia is about 15% of the national total.

Also in terms of capital stock of public infrastructure, 15% of the total is for Andalusia, although the proportion drops to 13% if we consider all types of assets.

The most common way to measure the economic importance of a region is its participation in the country's GDP and, in this field, the weight of Andalusia is around 14%. Per capita, the greater weight of the population and a lower proportion of GDP show a situation of below average income.

A complementary view of its weight is given by its share in total trade of goods which is above 11% for commerce in Spain and about 9% of Spain's exports to the world.

Moreover, and using one or other appraisal criteria, Andalusia is usually located in third position due to its weight within the Spanish economy, after Catalonia and Madrid. Around half of GDP, employment and capital stock of the Spanish economy is concentrated in these three regions.

But all this is a static observation, a snapshot of the integration of the regional economy. Now it must be supplemented with a dynamic vision to give us an assessment of change.

With respect to demographics or employment generation, Andalusia has grown at rates very similar to the national average. However, relating to human capital, the region has made an effort to introduce a positive element for the future. In the last twenty years the gap with the Spanish average years of schooling of the working age population has been reduced by almost a third.

The essential complement of human capital, physical capital in equipment, infrastructure and other facilities, has tripled in the last twelve years.

The economic weight of Andalusia measured the total regional GDP of Spain has also improved. Twenty years ago it accounted for 13.5% and 14% today.

The visible consequence of the growing effort to integrate Andalusia with increasing force in the Spanish and world economy can be summarized in the establishment of new businesses and growing trade links with other regions and the world: some exports to the rest of Spain have almost tripled in the last fifteen years and are close to doubling with the rest of the world. ■

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FOREIGN TRADE

Economic theory has always paid special attention to the advantages provided by trade as an engine for development. Trade allows economies on the one hand, to take advantage of diversity, making the differences in tastes, factor endowments and technological capabilities profitable; and on the other hand, benefit from the opportunities arising from the concentration of production and wider access to markets. In both cases, trade improves the situation of the economies concerned by increasing production efficiency levels and the range of goods and services available.

The growth process of the Andalusian economy has benefited generously from the dynamic effects of trade. Very often both exports and imports grew faster than GDP, which has, therefore, a tendency to increase their degree of openness1, which has been even more intense in their international trade flows. Thus, the degree of openness of its international exchanges stood at the beginning of the nineties, around 19%, only ten years later it went to above 37% and stayed at around 36% of GDP in the middle of this decade. Adding trade flows with other regions to these exchanges, the degree of openness went from 61% in 1990 to 84% of GDP in 2008, reflecting the significant integration experienced by the regional economy.

This process was consistent with a path, sometimes interrupted, of improvement in the levels of trade coverage due to exports growing faster than imports. Well, although it is true that Andalusian foreign trade has not abandoned its traditional deficit sign, exports of goods and services have managed to finance, on average, just under three quarters (69%) of imports, lessening the negative contribution to growth. Since the middle of this decade a decline in the coverage ratio has been noticed, given the high sensitivity of imports to the growth of income, only corrected in the last year as a result of the crisis. This improvement in the trade gap in Andalusia, has followed the progress of the trade coverage ratio with the rest of Spain, and the substantial increase that has taken place in foreign trade, caused by stronger growth of imports of goods and services over exports, has led inexorably to a breakdown of the balance maintained in the last decades of the past century. However, Andalusia continues to have more favorable results than the whole of the Spanish economy in its exchanges with other countries. A remarkable feature of foreign trade in Andalusia is the change in less than twenty years in the geographical orientation. Foreign relations of Andalusia, in the early nineties were very oriented to the Spanish territory, where it sold 71% and bought just over 80% of its goods and services. In the years of the new century, although with logical annual variations, just over half of Andalusian exports are to other countries and two-fifths of foreign purchases are made outside the Spanish territory.

This change in the geographic orientation of foreign trade has resulted in an intensification of relations, mainly exporting to European Union countries, and to a lesser extent to non-European OECD countries. In recent years, although still underrepresented in total foreign sales, some OPEC countries and America and Asia have joined this scenario. Instead, the geographical orientation of foreign purchases of Andalusia are still very guided by the need to import raw materials, especially fuels and mineral oils, which convert OPEC countries in the most important suppliers of the regional economy. However, the progress which has come about in the metal, electrical and electronics and transportation components industries, has resulted in their joint import requirements making up more than 18% of imports of Andalusia. ■

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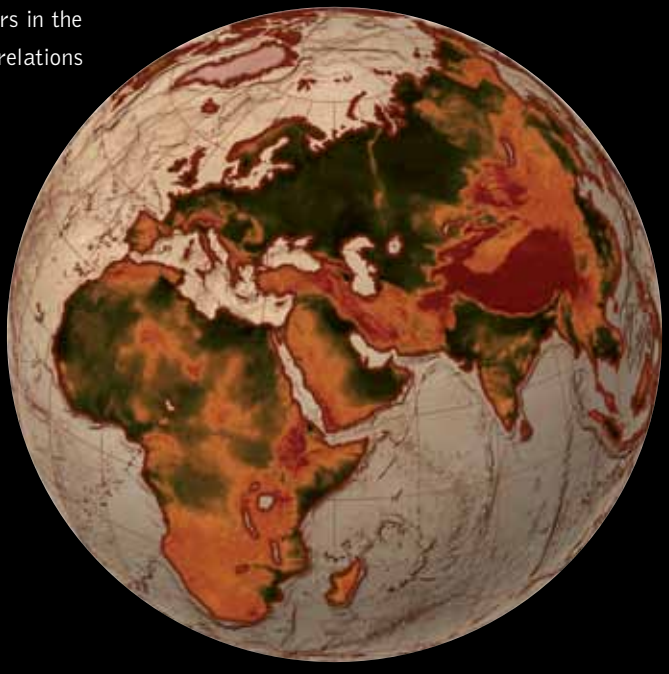

1. Measured by the coefficient of openness, total value of exports and imports with respect to GDP

Labour market changes

There is a story written by Washington Irving in the early nineteenth century, in which the protagonist, Rip Van Winkle falls into a deep sleep only to wake up 20 years later and find a totally different situation from the economic and technological point of view. This story serves to illustrate the technical and operational changes in society. In particular, it allows us to better understand the changes that have occurred in society, in particular, in our statistical system, through which we learn more about its functioning. Naturally, we cannot expect this system to improve outcomes for society; we only wish to understand them better.

Within the statistical system, there are many facets. In particular, it should be noted those relating to the labour market. When comparing currently available data with those we had previously, we are trying to highlight the improvements that have taken place in the statistical system of Andalusia, especially with regards to labour market data.

The Statistical System of Andalusia includes four new features that allow better analysis of the functioning of the labour market:

- The exploitation of administrative records, mainly those from the Andalusian Employment Service, since 2005.
- The incorporation of data on labour mobility, which extends the traditional information on cross-sectional data from 2005.
- The analysis of the labour market from the household perspective.
- The mainstreaming of gender perspective and foreigners in the exploitation of existing sources.

Next, we can carry out a small tour of the main aspects that reflect the evolution of the Andalusian labour market, where the growth in activity and employment, the incorporation of women into the labour market, the arrival of foreigners and the change in the sectorization should be mentioned:

According to data disseminated by the Institute of Statistics of Andalusia, various statistical sources verify the growth in employment over the last twenty years. The number of employed people has risen from 1,098,600 people in 1989 to 2,923,200 in 2009, the people registered in the Social Security rose from 1,890,900 to 2,906,100 over the same period and the numbers of registered contracts show that the initial number of contracts registered in Andalusia in 2009 was 3,404,700 and 1,020,524 in 1989.

In 2009 the unemployment rate was at levels similar to the beginning of the period (27.00% in 1989 and 25.35% in 2009). But has undergone major changes over the years with a peak in 1994 (34.59%) and a minimum in 2006 (12.68%).

The incorporation of women into the labour market and the arrival of immigrants accounts for the significant growth in employment and the active population in this period. Female activity rates, that is, the relationship between employed and unemployed women and those aged over 16 years, went from 30.38% in 1989 to 48.72% in 2009. The female employment rate, the percentage of working women between 16 and 64 has increased from 18.70% in 1989 to 35.52% in 2009. The active foreign born population went from 25,800 people in 1996 to 437,900 in 2009 and the employment rate of 31.89% to 51.18% in this period.

The distribution of employment by sector has changed in twenty years highlighting the decline in the weight of the agricultural sector from 15.98% in 1989 to 7.44% in 2009 and a significant weight gain in employment in the service sector, from 57.59% to 73.38% in this period. ■

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Companies and entrepreneurs

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1. Entrepreneurship in Andalusia

The search for new business opportunities and the ability to take risks, particularly in creating new economic activities, are two essential features of the entrepreneur. In a globalized economy in which innovation processes are intensified and the information available in the markets is increasingly abundant to both producers and consumers, the emergence of new products and the need for companies to continuously adapt their product to new and growing market demands, requires employers to have a special ability to detect the expected evolution of demand and a continuing effort to take risks.

The analysis of these business functions is not easy, because, on the one hand, of the limited statistical information available, and on the other, the results that existing opinion polls tend to produce are not significant enough due to the different biases observed in interviewees' responses and the limitations of the samples used in the studies so far. In the absence of other information, the creation of companies, although insufficient because it does not gather all the business activity and can show ambiguous results, remains a good approach to entrepreneurship.

If the number of companies created per 10,000 population and the average social capital are taken as indexes of the density of commercial companies, Table 1 shows the comparative evolution with the Spanish total of what could be considered as a reflection of entrepreneurial dynamism in Andalusia and each of its provinces during the last economic cycle. Two facts stand out: the convergence in the number and size of the companies created in Andalusia over the national average, and the dramatic effects of the economic crisis which began in August 2008 on business initiatives, having fallen to levels below those of ten years ago.

The search for new business opportunities and risk-taking are two essential features of the entrepreneur.

The data in this table, although there are cut-off times that may include factors not necessarily baseline measurements, show that the traditional spatial concentration of business in the triangle Seville-Malaga-Cadiz continues and even increases, and that the recent economic crisis has hit hardest in the interior provinces, and Almeria.

Table 1: Commercial companies created. Number of companies per 10,000 population and average capital (euros).

	1997		2004		2007		2009	
	Number	Capital	Number	Capital	Number	Capital	Number	Capital
Almería	23.22	26,218.5	37.75	40,921.3	34.39	100,885.8	17.83	36,879.5
Cádiz	12.84	25,317.8	20.45	25,054.8	19.27	86,359.5	10.25	33,056.0
Córdoba	13.08	39,695.6	19.80	42,220.2	21.78	255,516.7	12.36	28,074.2
Granada	17.91	22,640.4	26.52	47,873.4	36.32	47,253.5	13.89	29,543.3
Huelva	13.98	15,856.1	19.57	24,989.0	22.06	30,256.5	11.30	18,151.1
Jaén	10.59	17,766.0	14.99	27,624.3	16.10	39,497.9	9.02	27,073.7
Málaga	30.28	36,444.6	54.71	51,050.4	40.69	53,628.2	23.31	35,055.9
Sevilla	17.05	25,413.8	25.54	79,939.0	29.82	64,059.7	16.89	63,891.4
Andalucía	18.02	28,586.3	29.25	50,166.5	28.96	76,151.4	15.47	40,019.9
España	23.45	55,533.5	30.32	69,109.4	31.58	96,196.0	16.72	61,170.0

Source: INE. IEA. By the authors.

The data in this table could be complemented by the spatial distribution of business establishments, which also reveal the existence of large provincial disparities in terms of sectoral structure between inland and coastal Andalusia, and between east and west Andalusia. On the other hand, services account for a large percentage of the economic activity, although the most important branches are related to tourism and non market services, in which productivity is low, as well as improving more slowly in recent years, activities related to the primary sector also have a high weight; and within manufacturing, the branches of rigid demand and low technology account for more than 50 percent of the production facilities.

Additional information is given by the size of Andalusian companies, which can also be a good indicator of competitiveness, given that the average total costs usually decrease with the scale of production. What is clear from Table 2 is that under this criterion, the size structure of Andalusian companies has improved slightly in recent years and in 2009 was already very similar to the national. It is also significant, both in Spain and Andalusia, but more so in Andalusia, that the crisis has affected larger companies the most, nevertheless, companies with more than 20 workers represent only 2.09 percent of the total becoming a serious problem for innovation and increased competitiveness.

Table 2: Company size by number of workers in Andalusia and Spain (% of total firms).

	1999		2004		2007		2009	
	Andalusia	Spain	Andalusia	Spain	Andalusia	Spain	Andalusia	Spain
Without salaried employees	56.97	55.11	51.74	50.99	50.65	51.13	51.57	52.67
1 to 5	34.53	35.09	37.98	38.13	38.81	38.16	38.87	37.30
6 to 19	6.49	7.19	7.93	8.21	8.09	8.00	7.47	7.53
20 to 49	1.45	1.81	1.66	1.81	1.72	1.82	1.46	1.66
50 to 100	0.34	0.45	0.40	0.46	0.42	0.47	0.37	0.45
More than 100	0.22	0.35	0.29	0.40	0.31	0.42	0.26	0.39
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: INE. Central Business Directory. By the authors.

2. The accounting status of Andalusian companies: investment and financing

From a different perspective, the study of the role of the entrepreneur as an agent that efficiently uses production factors can be extended by analyzing balance sheets, which reveal the intensity with which companies use certain factors and resources (material assets, shareholders' and others equity). Table 3, in which the impact of the financial crisis is not yet reflected on the balance of Andalusian companies, shows the evolution of the main headings in recent years.

The weight of capital investment in the balance sheet total shows the use that companies make of the factor capital in their activities and, to some extent, also indicates the benefits given over to investment in previous years. In Andalusia, the weight of these investments in the balance, very low, has been declining steadily over the past ten years, although at lower rates than the national average, which has led to 24.10 percent in 2007 against 22.67 percent of the national. This result is consistent with other available information that Andalusian industrial companies are making a greater investment effort than the national average in recent years.

Financial fixed assets include, among other items, equity holdings in other group companies. It is the most important concept of the budget for the purposes of our analysis as it can be directly related to the size of the business group. The formation of business groups to promote the diversification of activities and markets, streamline the provisioning of resources, and ultimately take advantage of economies of scope, can be a very effective way to increase business competitiveness. In this sense, the weight of the financial assets of Andalusian companies is two to three times lower than the national, which may reflect a competitive weakness, or be a simple consequence of the circumstance of Andalusian companies as subsidiaries of national or foreign groups.

Table 3: Structure of the investment and financing companies in Andalusia and Spain (%).

	1997		2004		2007	
	Andalusia	Spain	Andalusia	Spain	Andalusia	Spain
Active						
Fixed assets	49.14	63.00	44.72	63.08	42.25	63.36
-Tangible assets	36.63	43,00	27.95	26.15	24.10	22.67
-Financial assets	6.89	15.80	11.48	34.43	13.67	37.96
-Other	5,62	4.20	5.29	2.49	4.48	2,73
Current assets	50.86	37.00	55.28	36.92	57.75	36.64
Total	100.00	100.00	100.00	100.00	100.00	100.00
Passive						
Own resources	34.64	42.90	31.52	41.17	29.64	37.98
Long-term borrowings	20.59	17.40	25.92	24.85	29.57	27.61
Short-term borrowings	44.77	39.70	42.56	33.98	40.79	34.41
Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: Statistical Institute of Andalusia and Bank of Spain, Central Balance Sheet. By the authors.

Regarding its financial structure, the various sources available, including this one, reflect unequivocally that Andalusian companies have less equity and therefore are relatively more indebted than the national total, and that this gap is widening in recent years, although we would need to know what has happened in the last two years of financial crisis. This means that, in comparative terms with respect to the national average, the distribution of the risks inherent in doing business in Andalusia is more biased towards debt finance providers than to the entrepreneurs themselves.

In a few words the analysis of the scale of operations and the use of production factors reveals that Andalusian companies are probably quite far from reaching an efficient size for their operations and combining the factors more efficiently. Large companies, the most able to compete in global markets, are rare and are distributed very unevenly throughout the territory, focusing primarily on the triangle formed by the provinces of Seville, Cadiz and Huelva, to which is added the province of Almeria. In general, large companies are focused in those branches in which a given territory is specialized and, except the great industries of the Bay of Cadiz and Algeciras and the Huelva chemical area, were promoted, at least in their origins, by local capital, usually having a long tradition in the province, or with location advantages, as in the case of Almeria.

The search for new markets abroad is one of the main avenues for company growth, increasing their size and improving productivity..

Moreover, Andalusian companies make less intensive use of capital, which determines the lower competitiveness. They also have fewer resources to fund new initiatives or consolidate projects and very few lead formation processes of national and international business groups. This reflects that the Andalusian companies and entrepreneurs are far from using the factors of production with a high level of efficiency, although there are indications of a change of attitude, especially in terms of new investments in certain industries.

3. Internationalization of Andalusian companies

The search for new markets abroad is one of the main avenues for company growth, increasing their size and improving productivity. In a highly competitive economy, this search, either by traditional means (exports, imports, foreign investment) or through different forms of access (mergers, cooperative agreements, joint ventures, etc.), is vital to companies´ future. The expansion of markets facilitates risk diversification, increases the scale of operations and brings new insights to the company (market, technological, institutional information, etc.). From this perspective, the analysis of the processes of internationalization is very significant to understand the attitudes and corporate culture in Andalusia.

The study of these attitudes can also be addressed through indicators. One of the most used, because of its availability, is information on foreign trade, which is shown in Table 4. The group of Andalusian companies presents rates of exports and imports, measured in terms of gross value added, significantly lower than the national average, but with a clear tendency towards closing this gap. If in 1999 the export rate in Andalusia was fourteen percentage points below the Spanish average (12.52 and 26.49 percent, respectively) and the rate of imports, thirteen points lower (6.96 percent, and 19.96 percent), ten years later these differences had been reduced to six and eight points respectively.

The Andalusian provinces with greatest exports are in this order, Huelva, Cadiz and Almeria. Foreign sales of chemicals, energy and some manufacturing from the areas of Huelva, Cadiz

Table 4: Import and export propensity of Andalusian and Spanish economies

	1999	2004	2007	2009
Imports/GVA				
Andalusia	12.52	13.65	18.50	13.57
Spain	26.49	27.54	30.20	21.35
Exports/GVA				
Andalusia	6.96	9.74	8.63	10.56
Spain	19.96	19.42	19.60	16.21

Source: Institute of Statistics of Andalusia and INE. By the authors.

and Algeciras, explaining the large weight of exports in the first two cases, while in Almeria horticultural products comprise the majority of exports. On the import side, the provinces with the highest degree of integration in international markets are Huelva and Cadiz, also for their industrial centres.

Therefore, with the exception of the nucleus of purely indigenous exporters of Almeria, some companies scattered throughout Andalusia that have traditionally sold their production overseas, such as wines from Jerez, and the industrial sector of Huelva and Cadiz with strong external links of supply and sale, Andalusian companies are characterized, according to indicators of average propensity to export and import, for making little effort in expanding their markets overseas.

To analyze the root causes that could determine these poor results, there have been some studies using as explanatory variables certain characteristics of the company (size, market in which it operates), the entrepreneur or executive (age, educational level, experience abroad) and the institutional environment (ease of access to information, support for business expansion, training programmes), throwing up some interesting results: on the first level of causation, the age and qualifications of the entrepreneur powerfully influence their appetite for risk, and the company's size and extent of local market determine their risk perception associated with this type of activity. On a second level, the risk perception and operational and information barriers, along with previous participation in export support programmes, influence future attitudes of businesses to foreign markets. We have also found some evidence that company size and foreign participation in its capital are important variables in explaining the propensity to export, not having found a statistically significant change between the company's technological intensity and the percentage of export sales.

From another perspective, foreign investment flows in Andalusia and Andalusian companies' abroad show that they make very little use of this instrument to consolidate their presence in foreign markets and are not likely to reach cooperation agreements with foreign investors as a way of initiating their international expansion. On the other hand, the sectoral distribution of foreign investment in Andalusia is very similar to the national, with the only significant exceptions that it receives proportionately more investments in agriculture and fisheries, trade, catering and transport and communications, and less in electricity, water and gas, banking and insurance, and real estate and other services. It seems, therefore, that the foreign investor is interested, either in the sectors where Andalusia has more growth potential (agriculture,

Photo: Javier Andrada

Photo: Javier Andrada

tourism), or in those in which the regional offer does not adequately meet demand (trade, transport and communications).

R&D activities are the main source of improvement in total factor productivity and hence economic growth.

In summary, both from the perspective of trade and from the standpoint of capital transactions, Andalusian companies and entrepreneurs evidence a low willingness to external openness and cooperation. The small size of businesses, narrowness of their domestic markets, poor links with domestic and foreign companies and certain objective characteristics of entrepreneurs (age, education, international experience, etc.) could explain this behavior.

4. Innovation and technological development.

R&D activities are the main source of improvement in total productivity and hence economic growth. From the company standpoint, incorporating new technologies into their products, processes and organization and management, constitutes a valuable tool to strengthen their competitiveness and thus to improve their market position. In an open, competitive economy, this business function is even more important. But technological progress is not solely the responsibility of companies but is the result of a combined public and private action, whose appropriate interaction depends largely on the success of the activity.

Andalusian companies of advanced services, driven primarily by demand from the Administration began to increase their R&D in the eighties. In the industrial sector, technological acceleration took place somewhat later, at the beginning of the nineties, in this case forced by the integration of Spain into the European single market. Moreover, it is necessary to point out that innovative enterprises in the agricultural and food sectors have generated very little diffusion of technological advances in the region, while innovative firms in manufacturing sectors and other advanced services have contributed to a greater or lesser extent, to technological diffusion, through the relationships they establish with customers and suppliers.

In 1997, the level of R&D expenditure in Andalusia was well below the national average, with only 1507 workers in such activities, only 5 percent of those employed at national level, and their sectoral distribution (companies, government and universities) also presented very unfavorable data for the companies. That same year, total expenditure on R&D by activity branch and company size in the manufacturing industry demonstrated that a proportionally larger effort was performed in those branches in which the region presents a certain degree of expertise (food , drinks and tobacco, rubber and plastics and, more distant, non-metallic mineral products and electrical, electronic and optical equipment), and small businesses (fewer than 20 employees) of the domestic food, beverage and tobacco sector carried out the same investments in R&D in absolute terms as that of medium and large enterprises, a fact that is absent in other activities, which may indicate that innovation is not necessarily linked to size, but other factors such as competitive advantages may be relevant. Although some improvement has been seen in recent years, the situation remains unfavorable for Andalusia. Table 5, repeating the limitations of the analysis by cut-off times, illustrates that the costs of innovation of Andalusian companies represented 9.5 percent of the national total in 2004, in 2008 they had fallen back to 5.3 percent.

Table 5: Expenditure on innovation of companies by employment stratum in Andalusia and Spain (thousand euros).

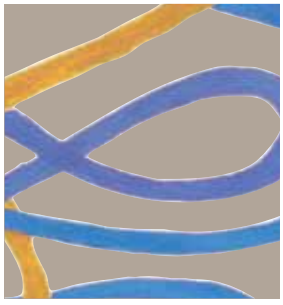
	Andalusia			Spain			Percentage Andalusia/ Spain
	Less than 250 workers	250 or more workers	Total	Less than 250 workers	250 or more workers	Total	
2000	342,674	291,384	634,058	4,864,061	5,310,198	10,174,259	6.2%
2004	737,781	444,995	1,182,776	5,569,910	6,920,903	12,490,814	9.5%
2008	694,490	364,436	1,058,925	8,616,998	11,301,948	19,918,946	5.3%

Source: Institute of Statistics of Andalusia, Survey on Technological Innovation in Companies.

Finally, to conclude, besides the above findings on company density, balance sheet structure, internationalization and innovation, it is possible to add a final consideration on the possible effects of the current economic crisis on Andalusian companies.

According to the latest Advance of the Labour Market Afi-AGETT, Andalusia has destroyed 21.890 companies from December 2007 to July 2010, 10.6 per 100 of its business today, slightly higher than the national average. There is no doubt that this destruction has affected primarily the weakest companies, but other medium-term consequences should not be underestimated. To the positive creative destruction Schumpeterian which must continue when the recovery begins, we must add, however, the inevitable loss of pa rt of the young business tissue that had flourished over the past three decades.

Innovation, sustainable development and globalization



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1. General approach

The need to innovate arises from failure. At least in the social determination that drives welfare and development, innovation as the need to transform knowledge into wealth, expresses inability to do something or do it in a certain way without knowledge.

This brief description of the ultimate motivation of innovation manifests itself today along with the concepts and realities that identify innovation as part of a process that integrates research and development, innovation systems and their agents, financial and human resources devoted to R&D, scientific production and economic activity resulting from R&D&I processes.

This sequence in which we frame today's innovation processes is, as reflected above, a complex network of actors and activities with a single purpose: to produce knowledge-based changes to create value. As is evident, if we produce changes it is because the initial result of our activity does not generate value in the quantity and quality required, or because the activity generated simply cannot withstand competition and is dragged along by technological development and other more competitive activities or products.

In this sense the initial statement is valid: the need for innovation has its ultimate motivation in failure or deficient consolidation of a project or a significant reduction in expectations in a given activity. This is what encourages individuals and organizations to bring in new solutions and provide the necessary knowledge to generate an innovative process capable of promoting changes and providing value to their business.

These concepts form a network of socio-economic realities in which innovation is a driving force and deliverer of new realities associated with economic development, with the fulfillment of social needs or the development of companies.

Indicators, reports, and statistics express the reality of innovation systems, their evolution and context over time. Equally important is the consideration of the environment in which systems operate. Future developments are determined both by the analysis of innovation systems and the environment in which they operate.

In 2010 we are talking about an unfavorable economic environment, an economic crisis, which fractures the ascendant path up tp 2007 of the Spanish economy with rates of GDP over 3% annually.

The evolution of the global economy will determine and condition the reality of innovation systems: the resources available, the orientation of activities and setting the desired objectives. Probably the environment requires a more rigorous project selection and better allocation of the economic resources available.

In this new economic and budgetary context it is quite likely that the positive development of the resources employed in R&D is reduced because, according to the 2010 COTEC report, resources devoted to R&D have risen from 0.91 % of GDP in 2000 to 1.35% in 2008. Human resou-

rces have also grown in the same period. In 2008, in Spain the number of full-time equivalent (FTE) workers in R&D activities is 1.79 times greater than in 2000.

The COTEC report also highlights that the evolution already stated corresponds to the maturing of innovation systems, which require teams with different professional profiles and strong technological support and management, not just researchers. The additional issue drawn by the general economic situation is the determination of the objectives of innovation systems.

And the answer lies in the correct relationship between innovation and globalization and the opportunities that must be generated in the existing global challenges. The challenges posed by climate change, natural disasters, international security and pandemics should form the basis of what we research and how we innovate. And not just because these risks may cause global incidents - in some cases they are already happening - but because the increasing financial resources we are devoting to global crises are growing and have no expected return, they are generated only to alleviate some of the more striking effects.

Probably the innovation we develop in the coming years will allow a reduction of the uncertainties of the future of humanity posed by these global challenges.

And surely innovation systems will have to adapt to these margins of economic activity in an environment of greater prioritization and efficiency.

Innovation systems are associated with knowledge, value generation and wealth creation. The World Bank Institute publishes two interesting indexes that reflect the situation of countries in these areas. The knowledge index (KI) measures a country's ability to generate, adopt and disseminate knowledge. It is therefore an indicator of the overall power of development of knowledge. It is developed through three of the fundamental variables of the knowledge economy: education and human resources, the innovation system, and information and communication technology. It excludes the economic and institutional regime.

The Knowledge Economy Index (KEI) measures the general level of preparedness of a country for the knowledge economy and whether the environment promotes the effective use of knowledge for economic development.

The twelve variables considered by this aggregate index are: tariff and non tariff barriers, regulatory quality, legislation, payments and royalty income, technical publications, patents, literacy rate, enrollment ratio in secondary education, ratio of higher education enrollments, total telephones, computers and Internet users.

Innovation systems are associated with knowledge, value generation and wealth creation.

These variables are added to the four basic elements of the knowledge economy. First, the economic and institutional regime provides incentives for efficient use of knowledge and the promotion of entrepreneurship. Second, the training and education of the population serves as a basis for sharing and using knowledge. Third, the diffusion of information and communication technologies (ICTs) facilitates effective communication, dissemination of knowledge and information processing. Finally, an innovation system consists of companies, research centres, universities, "think tanks" consultants and other organizations that can exploit the growing volume of global knowledge, assimilate and adapt it to local needs and create new technology.

Spain is at the intermediate stage of developed countries in the maturity and consolidation of its innovation systems. Generally, we understand better the process of innovation from the public initiative than from the private; we have developed more basic research than continuity in development projects and have significant deficits in the association of research with business initiative and entrepreneurship.

The Knowledge Index (KI) 2008 has a value of 8.40 for Spain over 10 and ranks us 21 out of 140 countries surveyed.

The Knowledge Economy Index (KEI) for Spain reflects a value of 8.45 over 10 and we are ranked 19.

The four basic elements of the knowledge economy reach for Spain, according to the World Bank Institute information, the following values: economic incentives regime 8.58, innovation 8.95, education 8.21 and ICT

8.04. These same elements with the introduction of the weighting factor of the population reflect the following values: 8.58, 8.14, 8.21 and 8.04.

The valuation expressed by the knowledge and the knowledge economy indexes places us slightly below our position in the ranking of world economies. We are in the group of developed countries and far ahead of other countries.

The uncertainty of our innovation system lies in whether the knowledge generated and applied in productive activities is going to be a driving force of economic development or will suffer - if not redirected properly - the same limitations and structural and circumstantial problems as the general economic evolution.

2. Andalusian Innovation System

The Andalusian Innovation System has made progress over the last twenty years, but still has structural weaknesses that hinder its full articulation and limit its ability to generate added value to knowledge in the Autonomous Community.

Photo:: Antonio Gaga

First, the high component of public over private spending on R&D is a risk for the future of Andalusian innovation. However, it is not if in some areas of autonomic activity in R&D (e.g. in health R&D) the positioning is guided by the desire to reduce the gap from publicly owned health care and of regional competence. But if the analysis is carried out making comparisons with national and international indicators, the risk is embodied in the low connection of public R&D with the factors that determine the acceptance by companies of the results of the research such as the innovative application of results, that is, the lack of conclusion of the Andalusian Innovation System through changes in economic activity based on knowledge.

The 2009 OECD data for Spain and 2009 INE (the National Statistics Institute) for Andalusia referred to 2007, 63% of R&D in Andalusia was carried out by the public sector compared with 44% in Spain, 35% in the EU-27 and 28% in the OECD.

Table 1. Expenditure on R&D in Andalusia, as percentage of the total for Spain distributed by sector

	Andalusia	
	2001	2008
Business sector	5.9	6.4
Public Administration sector	12.0	13.5
Education sector	14.0	16.8

Table 2. Expenditure on R&D. Percentage of GDP

	2001	2007[1]			
	Andalusia	Andalusia	Spain	UE-27	OCDE
Business sector	0.16	0.38	0.71	1.12	1.59
Public sector	0.43	0.64	0.56	0.63	0.63

1. Data of expenditure on R&D of Andalusia 2009 are in the statistical annex.

The weakness of the Andalusian Innovation system is not only in the low involvement of the business sector in research, but the lack of correspondence and balance between the contribution of the public and private sectors, as we shall see, this is made explicit by the data of patent applications, utility models and industrial design.

Second, the higher education indicator. The gross enrollment rate in first and second cycle university education has maintained a downward trend in the period 2000-2007 and with respect to the third cycle is at the end of the period in a very similar position to the start.

The difference between Andalusia and Spain in the net enrollment rate has declined 0.3% from the period 2000/2001 to 2008/2009.

The importance of this indicator lies in that it constitutes the human capital for future innovation.

The maintenance of the national total differentials draws a situation of little change in the low adjustment of the Andalusian innovation system to new development challenges, especially from the production system, and inadequate provision for the future of new human resource capacities to enable generational renewal and continuity in the innovation system.

Third, according to Eurostat statistics, human resources in science and technology (HRST) also show a risk in the innovation system. Between 2000 and 2007, Andalusia has increased by five percentage points its human resources in science and technology, but the difference between Andalusia and Spain as a whole at the end of the period was seven percentage points referenced to the workforce. In 2007, Andalusia had a rate of 32.7 per thousand compared with 39.7 in Spain of human resources employed in science and technology of the overall active population between 25 and 64, and with third level education. In any case, these rates are above the UK, Czech Republic, Italy, Hungary, Poland and Portugal.

Comparing the HRST figures with those for the core HRSTO, resources actually employed in scientific and technological activities, in which Andalusia had a rate of 19.4 and Spain of 22.2, the situation shows a relative decline compared with other European countries, except Greece and Portugal, and denotes a lower proportional employment in these resources both in Andalusia and in Spain against the professionals and technicians engaged in higher education science and technology activities.

As stated above, the maturity of an innovation system is directly related to the diversity of professional profiles and technological and managerial support to innovation systems and, in this sense, the comparative difference between HRST and HRSTO both in the analysis of the Spanish and the Andalusian systems as compared with other European countries, illustrate the weakness of both.

Fourth, another risk of the Andalusian Innovation System comes from the analysis of the distribution of the amount spent on R&D by high and medium high-tech manufacturing firms and high tech services by autonomous communities.

The information provided by the INE 2009 from R&D indicators 2007 evidences that 65% of R&D in Spain is concentrated in Catalonia, Madrid and the Basque Country. 71.7% in high and medium-high manufacturing firms and 58.4% in high-tech services companies. Andalusia contributes 5.3% of the national total including both sectors.

This indicator shows once again the relative weakness of the innovation system in Andalusian business development and its scarce development despite the effort of public investment and conceivably also explains the emerging public sector adjustment to the needs of innovation in companies.

Finally, it is wise to note the risk that is derived from the indicators of patent applications, utility models and industrial design. In referring to data from INE 2008, of a national total of 3599 patent applications, 433 applications were from Andalusia, 226 of a total of 2,521 in applications for utility models, and 133 of a total of 1,377 applications in industrial design. That is, 12.03%, 8.96% and 9.66% respectively separates us from the weight that Andalusia has in other indicators not only population but also of regional participation in national GDP.

In accordance with the Institute of Statistics of Andalusia (IEA) and the INE surveys, these data are supplemented with the ICT usage and e-commerce in enterprises that represents, in 2008 in Andalusia, 11.9% and 14.6% in the national total.

The overall picture of the Andalusian innovation system has notable weaknesses in the practice of agents and actors of innovation and some of them such as university education have a tendency, in general, of inadequacy for the future with respect to technological challenges and innovation in business needs and in meeting social needs. Some elements of positive adaptation in the Andalusian Innovation System can be found in the evolution of contracts and agreements for R&D between universities and companies, the explicit objectives of the Europe for Higher Education and the increase in placements or the outgoing and incoming Erasmus.

In conclusion, despite public efforts in higher education, innovation infrastructure, and R&D financing the Andalusian Innovation System expresses two structural issues that determine its evolution: low productive sector

involvement as an active agent of innovation on the one hand, and the lack of continuity of the early stages of research with innovative changes in production on the other.

There are certainly some positive experiences that have generated solid business projects where technology and innovation are the solid bedrock of sustainable activities. And in some cases, such as the marble industry, the sequence between public impulse, innovation and consolidation of the business has been fully successful.

3. Why do we need innovation?

That is the question to be asked. Global challenges and the situation of Andalusia in this context require significant changes in the innovation system. Increased capacity in the public sector is probably not required, nor even an extra effort in technological infrastructure creation, or a larger university.

The answer to the question lies in the reorientation of our innovation system and certainly in the prioritization and selection of public funding to promote the link between R&D and innovation in the productive system and the promotion of a culture of risk associated with the generation of successful knowledge-based value.

The Andalusian innovation system needs to singularize, highlight and promote the difference in the valuation of research groups, training centres and companies willing to innovate in processes and products. Repositioning, in a nutshell, the administration and public sector R&D in promoting sustainable development and promoting the transformation of the business to strengthen the innovation system, overcoming the weaknesses noted.

This is about the orientation of activities to serve the needs of a society that has evolved positively in recent years, but this has the risk of not managing to define its role in the world of innovation, if corrections are not introduced in the system of science and technology in the direction of higher education and a greater definition of the public impulse of the innovation system management. ■

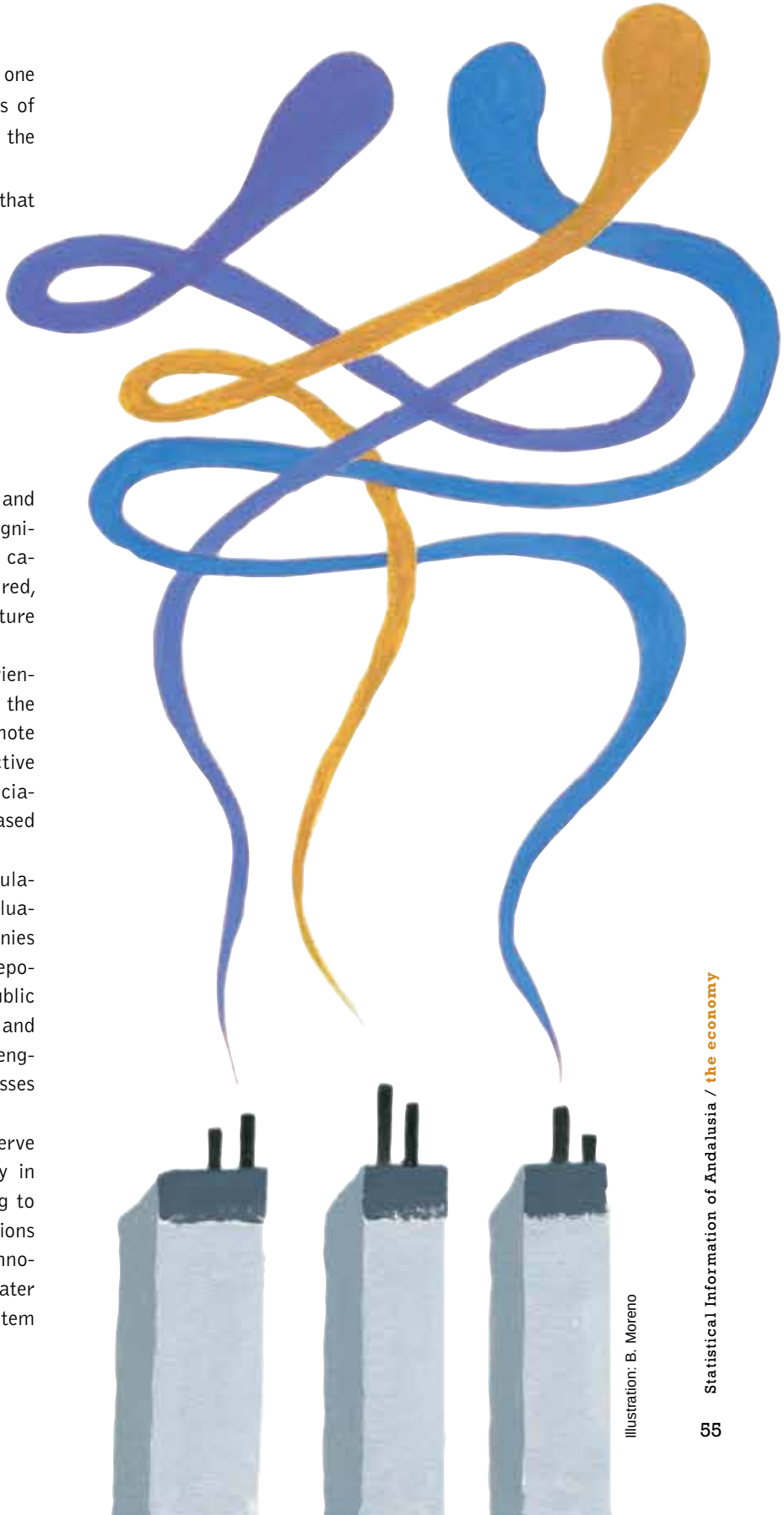


Illustration: B. Moreno

Guidelines for a **economy** more **sustainable**

The current economic crisis is a global crisis that affects the production and consumption models based on the disproportionate use of resources and the generation of environmental and social negative externalities.

The following is a brief description of the economic cycle and its role in global challenges: human societies have allocated financial, human and technical and technological resources to production based on renewable resources while simultaneously causing important changes in the earth's climate. Recently additional resources have been needed to address environmental degradation and climate change effects. And the resources we have been able to use are limited or at least disproportionate between degradation and recovery.

The economic crisis, regardless of its origin, has shown that the more resources we use in an already unsustainable model the more negative effects we generate increasing recovery costs and making economic activity more expensive.

Innovation is the starting point to break this vicious circle. This is because the generation of knowledge-based value is the engine for the transformations needed. We require innovation to drive a different model of production and consumption based on the intelligent management of available resources.

And above all, innovation must be the driving force for change in personal and collective culture about how we live, how we produce, how we conserve, how we move, and, ultimately, how we manage resources. It involves changes in the government and private sector and in the relationship between them. It means recognizing that we are probably not going to be able to do what we have been doing and we will unquestionably not be able to continue doing it in the same way.

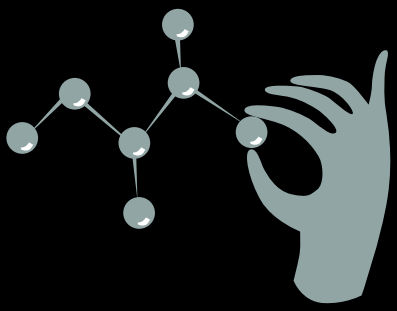
And this transformation of the model to allocate resources to global challenges calls for transparency in production and management structures, demands an ongoing analysis of what we do and how we do it, to ultimately, put sustainable development at the most prominent objective of human society.

In Andalusia the lack of sustainability of economic growth is evident. The intensive use of land and especially the coast causes not only negative territorial effects and environmental impacts, but the economic function is based on a system in which players obtain benefit or satisfaction, but at the cost of unsustainable natural, environmental and financial resource demands.

Altering the logic of the system has to be the new paradigm of the Andalusian society in globalization with at least two purposes: to renew the attractiveness of Andalusia with a system of active, flexible and adaptable innovation, and second, build innovation as the focus of sustainable development in its three aspects: economic, social and environmental. ■

Fernando Martínez Salcedo
President of the Environmental Observatory of Andalusia.

20 years of R&D in Andalusia



The Autonomous Community of Andalusia was a pioneer in the Spanish State to establish an instrument to promote and coordinate research and to lay the foundation and implement a modern R&D&I. This instrument was the Andalusian Research Plan (PAI) which was adopted in 1990.

Since the PAI I to the current, PAIDI, the overall objective has been to generate knowledge and highlight it. This action in the beginning was designed to enhance the quality of technological scientific activities and the number and improvement of human resources. Later actions were incorporated to boost the encounter between scientific supply and technological demand increasing collaboration between public research centres and companies. In these years in Andalusia there has been a significant increase in the provision of research resources: From 0.59% investment in R&D with respect to GDP in 1995, we reached 1.03% in 2008; in 1989 there were 8,828 persons engaged in R&D, currently staff registered by the PAI reaches 25,097 and the weight of Andalusia compared with Spain has gone from 8.13% in 1989 to 10.77% in 2008 according to National Statistics Institute (INE) measured in Full-Time Employment. As for the inventive activity, this has risen from 5.66% in 1990 to 11.18% of Spanish patents out of the total patents applied for in Spain in 2009.

With regard to participation in the Framework Programme (FM) for R&D in the EU, the return has been of 3.20% in the FM III (1990-94) and 6.20% in the FM VII (2007-2012) according to data from April 2010.

The first Plan introduced the concept of "research group" as an operational structure to design the scientific policy actions in Andalusia, and after years of operation achieved widespread recognition in the Organic Law on Universities. This created the structure of the system by preventing the fragmentation of the scientific community, bringing workers to academic research centres with common interests. These groups, 933 at the start and 2,044 today (data 2009), are divided into several areas: Agro-alimentation, Bio-sanitary and Health Technologies, Physics, Chemistry and Mathematics, Natural Resources and the Environment, Production Technologies and Information and Communication Technologies, which have been boosted by aid to groups from an investment of € 8.8 million in 1989 to € 14.11 million in 2009.

The actions of the research plans have been designed for greater interdisciplinary and cross-disciplinary coordination of research groups, to increase human and material resources and to achieve greater internationalization. To fulfill these specific goals during these 20 years, 15 research centres and institutes have been established in priority areas for socioeconomic development in the region and have been awarded 1,390 Excellence projects. Since 2005 these projects have mobilized over 252.3 million euros, of which 124.5 million euros related to staff (1,597 grants). To these contracts or grants must be added the 6,570 granted in previous years that have allowed the training of pre and postdoctoral personnel and returned them to our system. Aid to improved internationalization has been formalized as scientific mobility aids (7,430) and 5,350 for organizing and attending congresses.

From the analysis of the results obtained during these 20 years we could say that the four R&D&I plans have structured the Andalusian system playing a cohesive role, they have established a sense of belonging to a scientific community and facilitated the creation of scientific-technical networks. Moreover and very significantly they have instilled a culture of competitiveness to increase participation in the National Plan and Framework Programme. These achievements do not correlate completely with parameters necessary to consider the system of knowledge (R&D&I) balanced such as: percentage of expenditure on private R&D, adequate risk capital, number of patents and number of technology companies and their billing. To try to correct this imbalance initiatives have been launched combining the increase of potential that research generates with the enhancement of knowledge generated. The Corporación Tecnológica (Technological Corporation) stands out among these initiatives, with which a significant commitment of private activity has been made to develop economic investment for joint projects. The results to date are excellent and allow us to indicate that our system of knowledge is on the right track to improve competitiveness in Andalusia and generate wealth, welfare and progress. ■

Pilar Aranda Ramírez
Professor of Physiology. University of Granada..

The Territory and the Environment

Territory

- Metropolitan and coastal areas have grown by 1.2 million people in 20 years, accounting for 70.8% of the Andalusian population.

- Built up areas have increased from 1.6% to 3% of Andalusian territory in 20 years.

- The kilometres of highways, motorways and dual carriageways have increased from 689 in 1990 to 2,609 today.

- The number of vehicles has risen by 3 million to reach 5.3 million, which means moving from 0.3 to 0.6 vehicles per capita.

- Maritime goods transport grew by 75% between 1990 and 2009 going from 55.9 to 97.9 million tonnes.

- The number of passengers at Andalusian airports has increased by 151% in the period 1990-2009, reaching 18.6 million in 2009.

Environment

- Protected areas have reached 20.2% of the Andalusian territory, 2,200 square kilometers more than 20 years ago.

- The percentage of municipal solid waste for composting went from 29.5% to 56.9%.

- The final energy consumption in the last decade has grown from 11,631 thousand tonnes of oil equivalent to 15,214 in 2008.

- Evolution of primary energy consumption by source of energy

	Variation Rate 1995-2008 (%)
Coal	-28
Renewable energies	85
Natural gas	657
Oil	37

Territorial transformation in Andalusia

Josefina Cruz Villalón
Professor of Human Geography. University of Seville

The territory, as a physical support of human activities, experiences changes in its use or occupancy to the extent that the development demands different forms of territorial use or exploitation. Territorial changes, then, are the physical representation of the changes a society undergoes in its economic, demographic and/or social and cultural development. In that sense, we tried to determine what variables, what factors may result more eloquent of the territorial changes experienced in Andalusia over the last twenty years. To this end, we have considered territorial transformations as changes that translate those registered in the economic structure or social organization, and also considering that the resources and territorial organization are one of the main assets of a society in its economic development and to achieve a better quality of life. This has led us to examine three variables of strong territorial stamp, which are in turn cause and/or effect of socioeconomic transformation: land use, population distribution and the road network, all considered at the regional level.

1. Changes in land use

At regional level and in a short period of time, such as the twenty years we are trying to evaluate1 here, a priori it is difficult to detect changes in land use. Yet the changes are significant: and reveal trends that confirm other transformations that have occurred in Andalusian society and economy, and highlight where some of the changes with the greatest territorial impact are taking place.

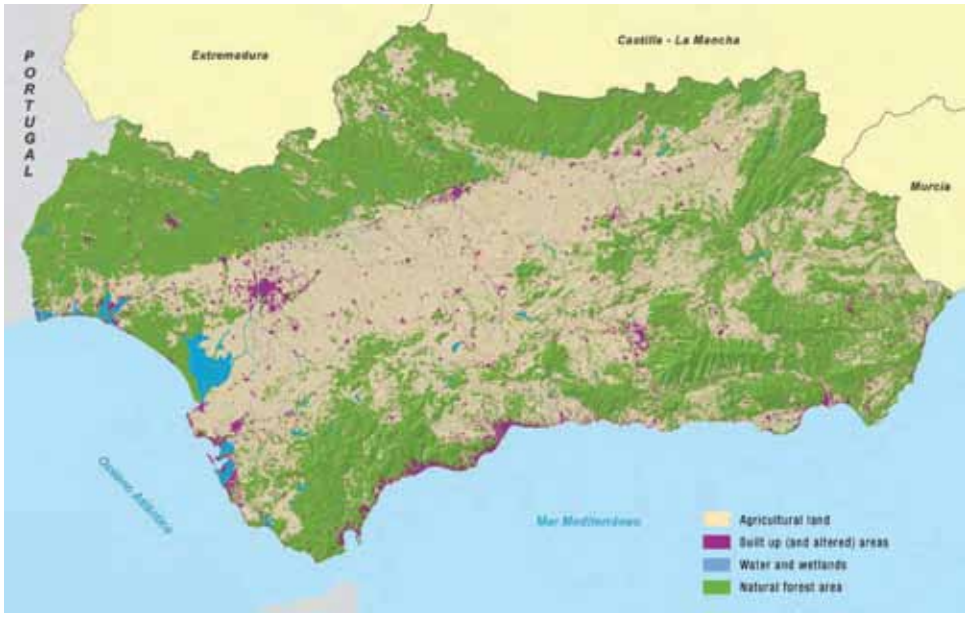
Map 1 reflects the main land uses in Andalusia. According to their qualities, the mountainous areas and northeast Almeria have a forest vocation, while the valley and fertile plain of the Guadalquivir are the domain of either dry crop or irrigated farmland. In the balance between forest and agricultural areas it is noticeable that natural woodlands exceed agricultural lands, seeing as the former cover 51.3% of the regional area, while the latter only 44.1%. This corrects, or calls into question the image of a predominantly agricultural Andalusia: forest areas exceed cultivated areas.

> Territorial changes are the physical representation of the changes a society undergoes in its economic, demographic and / or social and cultural development.

Moreover in the last twenty years there has been an upward trend in natural forest area by over 90,000 hectares while the area under cultivation has declined by more than 230,000 hectares. Caution must always be taken in analyzing the results of trends or changes in land cover and land use, as evaluation methods may have undergone changes over time (especially, in advances of measurement accuracy). Taking this concern into account, several factors combine to explain the changes in land use. On the one hand, public policies (from community to regional) in relation to development, support and/or grants for certain activities in rural areas; and

1. It could be considered that territorial changes, by their very nature, have a different time scale than can be detected in the fluctuations that affect other variables such as economic or demographic, in summary, a slower time scale.

Figure 1 Land use and vegetation cover 2007



Source: Regional Government Ministry of the Environment, 2010

on the other, the dynamics of agroforestry activities in a predominantly non-agricultural economy. In my opinion, the most important question is the reduction of agricultural land, in some cases abandonment of marginal crops due to their decreasing profitability, and in others due to the use of relatively profitable agricultural land for urbanization.

Moving on to another issue, although the magnitude of built up (and altered) spaces is much smaller (3% of the regional area), their territorial impact is clearly perceptible, even at this scale: in the image the location of a number of cities within the region, particularly in major metropolitan areas and, above all, the urbanization of the Mediterranean coast from the Bay of Algeciras to the east coast of Malaga can be identified. With respect to evolution, the most notable has been the increase experienced by the built up spaces, because the surface area has almost doubled (1.87), from 141,000 to 263,000 hectares between 1991 and 2007. The growing tourist economy of sun and sand is perfectly reflected in this coast line with as much force and clarity as other economic indicators could offer.

Table 1. Evolution in land use and vegetation cover in Andalusia (1991-2007)

	1991		2007	
	Surface area (ha)	%	Surface area (ha)	%
Agricultural land	4,096,377.11	46.8	3,865,887.56	44.1
Built up and altered areas	141,010.35	1.6	263.264.17	3.0
Water and wetlands	120,857.37	1.4	137,941.92	1.6
Forest and natural areas	4,401,455.18	50.2	4,491,803.91	51.3
		100.0		100.0

Source: Regional Government Ministry of the Environment, 2010


Photo: Antonio Gaga

2. Redistribution of population in the territory

The transition from an agrarian to an industrial society, and for Andalusia, a service society focused on sun and beach tourism has had as one of its great territorial manifestations population losses in rural communities and the depopulation of large areas of the region, at the same time witnessing its concentration in the cities and coast. This is a process that in Andalusia has been occurring over the past half century, and has maintained a similar trend in the last two decades, although it is now less intense, but the tendency is to continue concentrating population in coastal areas.

Table 2. Population distribution of Andalusia according to ranges set in the Spatial Planning of Andalusia

	1991		2001		2009	
Scopes	Population	%	Population	%	Population	%
Regional centers	3,812,832	54.9	4,075,855	55.4	4,584,063	55.2
Rural centers	444,188	6.4	419,307	5.7	418,050	5.0
Medium sized inland towns	1,857,006	26.8	1,878,995	25.5	2,010,755	24.2
Medium sized coastal towns	826,496	11.9	983,401	13.4	1,290,055	15.6
Total	6,940,522	100.0	7,357,558	100.0	8,302,923	100.0

Source: INE. Population Census 1991, 2001 and Municipal Register 2009

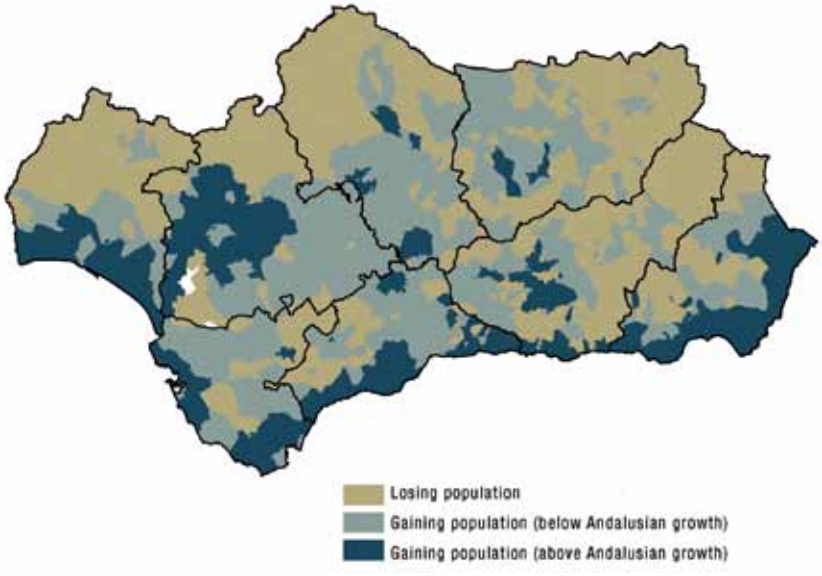
In Andalusia, between 1991 and 2009, there has been an increase of 1,362,400 people, an increase of nearly 20% over the initial reference year. Analyzing the spatial distribution according to the criteria set in the Spatial Plan of Andalusia (regional centres, rural centres, medium sized inland towns and mediums sized

coastal towns) we observe, first, the continuing decline in both absolute and relative terms of the population in rural centres: only 5% of the Andalusian population reside in these areas, compared with the average growth experienced in Andalusia of 19.6%, rural areas have seen their population decline in the last 20 years by almost 6%.

Medium sized inland towns, the traditional agro-towns, manage to maintain a significant weight, with more than two million inhabitants and nearly 25% of the Andalusian population, although, in relative terms, they have lost weight. However, the system of medium-sized inland towns retains a great importance in the internal articulation of Andalusia and its regional balance, as centres of public services and generation of local development. The regional centres, with more than 55% of the Andalusian population, are undoubtedly the central nodes of economic activity and population concentration, but their relative weight remains stable: they have grown at the average rate of the whole region. Finally, it is the medium sized coastal towns which continue to gain weight in Andalusia. In the last eighteen years they have gone from 826,500 to over 1,290,000 inhabitants, a net gain, then, of more than 463,000 people, an increase of 56% in relative terms: intensive agriculture, tourism, real estate and immigration (internal and external) are the key factors to explain the situation; and hence, also, the suitability of implementing inter-municipal planning of urban development of these areas.

Another way of approaching the territorial changes that have occurred in the distribution of the population in Andalusia in the last twenty years is offered in map 3, reflecting the areas that have lost population in absolute terms (brown), zones that although they have grown in absolute terms do so below the mean values of regional growth (light blue) and areas where growth has been higher than the regional average (blue).

Map 2. Relative growth of the population in Andalusia between 1991 and 2009



Source: INE - 1991 Population Census. INE – Revision of the Municipal Register to January 1st, 2009.

As can be clearly seen, most of the provinces of Huelva, Cordoba, Jaen and Granada, the northern province of Seville and the mountains of Ronda, except the main district are losing population in absolute terms. Furthermore, the above-average growth is concentrated along the coast, in the metropolitan area of Granada, and to a greater extent, in Seville. Other growth centres within the region, less significant and

Photos: Javier Andrada

either linked to other metropolitan areas (Cordoba and Jaen) or local development districts can be seen in the image. Attention should be paid to the growth registered in the region of the Valley of Almanzora (Almeria) between Macael inland and Pulpi and Cuevas de Almanzora on the coast.

The areas that lose population coincide with inland areas, mountain areas, areas already under an intense migratory process in previous decades, ageing and with negative growth (vegetative and migratory)[2]. Strong similarities can be noted between the distribution of areas loosing population and those in which forest uses are predominant. The potential of these regions, in my opinion, is to know how to take advantage of the opportunities offered by their location in areas of high ecological value, which in economic terms must be converted into sustainable development of rural and nature tourism.

On the other hand, it is also worth stressing the population redistribution processes in the metropolitan areas of major cities of Andalusia. All provincial capitals except Almeria are either losing population in absolute terms, such as Cadiz and Granada, or their growth is below the regional average; it is particularly striking along the coast, where major blue spots coincide (among others), with the municipalities of Huelva, Cadiz, Algeciras and Malaga. Cadiz must always be considered an exception given the small size of the municipality, fully urbanized and saturated long ago so it has been losing population to other cities in the Bay since the early eighties.

What is noteworthy now is the reversal in trend that has occurred in all major cities of Andalusia, capitals of their provinces or regional centres. These were the main recipients of population in previous decades, to the extent that they were (and remain) the main generators of employment and public and private services providers. They have not lost these functions, and the combination of the physical occupation of many of their municipalities, the logic of the housing market

2. The percentage of people over 64 is increasing in Andalusia, as in the whole of Spain, inversely proportional to the population centre size. Thus, in Andalusia, in 2003, 14.8% of the population was over 64 years. This proportion is greater in the centres of less than 10,000 inhabitants: it reached 23.2% in the 1,000 and 2,000 population category and 26.2% those with fewer than 1,000 inhabitants. (Andalucía. Segundo Informe de Desarrollo Territorial, pg. 274 Andalusia. Second Territorial Development Report). Correlatively, they registered the lowest fertility rates and have a negative migration balance.

Photos: Antonio Gaga

and the tendency of some social groups to opt for a more open residential environment (the dispersed city or semi detached town) have extended the urbanized areas beyond the limits of the main town, so that the towns currently experiencing higher growth, except those related to tourism, are those of the metropolitan areas of major cities.

As the main result of this new territorial reality- the expansion of urbanized areas in the vicinity of large cities- the changes that have taken place in mobility should be highlighted, because each of these areas have come to constitute units of dwelling, work, leisure and of demand and use of facilities and public and private services. Mobility increases, particularly mechanized mobility by private transport, and to the extent that employment and services continue to be focused on the main city, we experience daily pendulum movements from suburbs to central city, with significant problems of congestion and environmental sustainability. In this sense, firm policies are essential to promote public transport and non-mechanized means to improve such conditions of mobility, in summary, citizens´ quality of life.

3. The road network

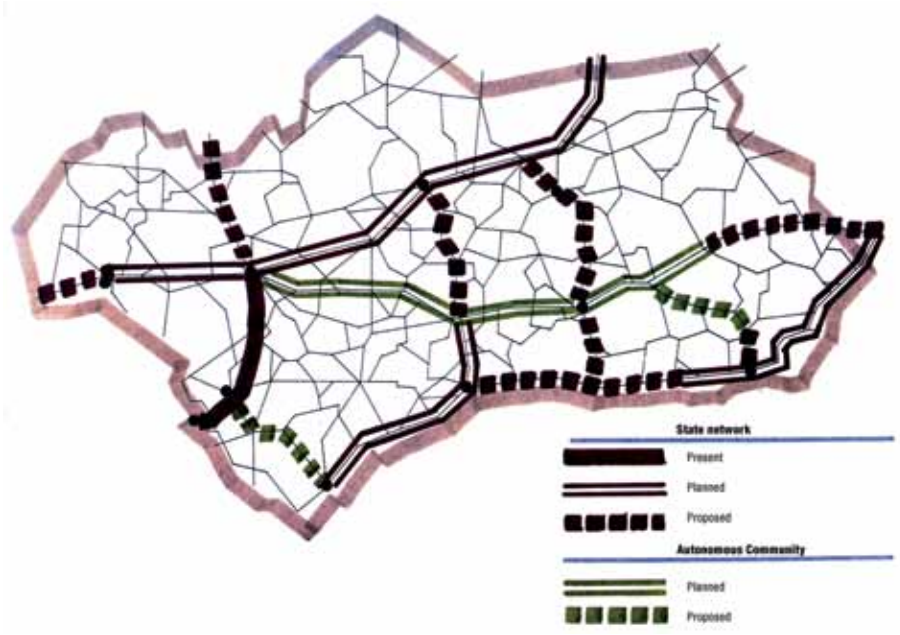
One of the most important transformations experienced by the region over the last twenty years has been the improvement of its overall road network and the construction of a motorway network, partly under state competence and partly autonomous, linking all regional centres and a considerable number of medium-sized cities with each other and with the Spanish and Portuguese network.

In 1990, the Junta of Andalusia published Bases for Town and Country Spatial Planning in Andalusia, presented as a first proposal and predecessor of the contents of the future Town and Country Spatial Plan3. As shown in Map 3 in Andalusia at that time there was only one highway: a toll road connecting Seville, Jerez de la Frontera and Cadiz. As part of actions planned and already implemented were: the widening of the N-IV (current A-4), main communication with the centre of Spain, that connects Bailen with Seville and Cordoba and continues until Huelva in the current A-49, A-92 Sevilla to Baza, under regional competence, some sections of the Mediterranean corridor from the French border to Algeciras (the A-7), also under state competence, but in that time, the General State Administration had only scheduled the coastal sections of Almeria, Malaga and part of the Cadiz; and the Malaga to Antequera connection.

3. The Law on Town and Country Planning of the Autonomous Region was adopted in 1994, four years after the preparation of this document. The Bases and Strategies of the Spatial Town and Country Plan of Andalusia were approved in 1999 by decree of the Governing Council and, finally, the Spatial Plan of Andalusia approved by the Government of the Junta of Andalusia in 2006.

Judiciously, the Basis for the Town and Country Spatial Planning of Andalusia proposed in accordance with the Plan Director de Infraestructuras, PDI, 1993-2007 (State Infrastructure Master Plan), the closure and continuity of the foreseen axis points and meshing of the network. Regarding the first objective, the closure of the Mediterranean motorway (A-7) on the coast of Granada, the extension of the A-92 to the border with Murcia and its connection at that point with the A-7; and the extension of the A-49 to the border with Portugal were proposed. With respect to the second objective, the cross-meshing of the three available longitudinal axis (A-4, A-92 and A-7), with four cross-sectional axis: Algeciras / Jerez, Antequera / Córdoba, Motril / Granada / Jaén/A-4 and Almeria/A-92 were proposed. It also includes converting into a highway the connection with Extremadura and the other western regions of Spain, via the historical axis of the Ruta de la Plata. The document of the basis for the Spatial Planning of Andalusia was cautious in its forecasts and only posed this picture, then the final image of a network of major routes structuring roads of Andalusia, was a 'medium and long term goal, once implemented the present forecasts''. [4].

Figure nº 3. Improving accessibility. Road network. The main connection areas



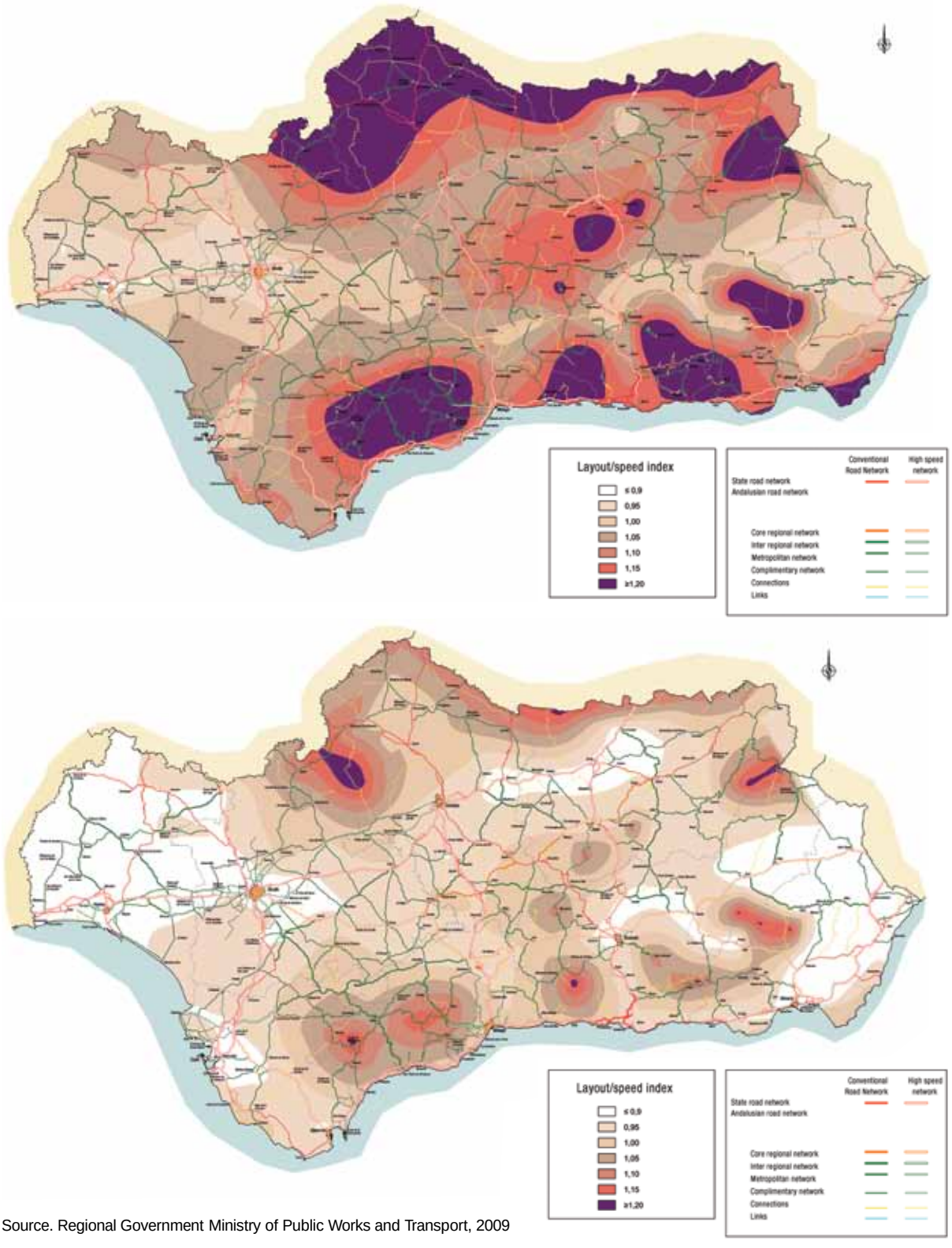
Source: Basis for Spatial Planning in Andalusia (1990).

At the starting point, 1990, only the toll Sevilla-Cadiz was in service throughout its length, and there were in total 689 km of highways, motorways and dual carriageways available, including in this figure also the sections that were already in service of the A-4, A-49 and A-92. Currently (2009) the network of highways, motorways and dual carriageways in Andalusia reaches a length of 2609 km, which means having 3.6 times the existing accessible extension in 1990 and that the density of the regional road network has been equated to the levels of the network of Spain[5]. But above all, it means that this road link scheme reflected in the Basis for Town and Country Spatial Planning of Andalusia and then considered as a final long term representation, is now in service (with the exception of some sections of the A-7) and even the connectivity of inland Andalusia with other

4. *Basis for Spatial Planning of Andalusia*, 1990, pg. 72

5. Both in Andalusia and Spain, the density of highways + motorways + dual carriageways is 0.03 km/sq. km in 2009, and the density by population is 0.31 km/1000 inhabitants in Andalusia and 0.32 in Spain. IEA. Basic Data, 2010..

Figure 4. Accessibility changes experienced by the road network 1994-2008.



Source. Regional Government Ministry of Public Works and Transport, 2009

axes has continued to be strengthened, to which we must add the improvements seen all across the network, which distributes traffic throughout Andalusia.

In more quantitative terms, the mobility in the whole Andalusian network increased by 2.02, between 1994 and 2009, from 6,345 to 12,796 million vehicles/km/year, the core road network rose from 2.521 million vehicles/km/year in 1994 to 5,400 in 2009, and traffic increased by 2.14. That is, traffic has grown proportionally more on this principal network[6].

In terms of global accessibility, the entire region has benefited from the improvement of its road network, so that, as shown in a recent study by the Regional Government Ministry of Public Works and Transport, the improvement of road Infrastructures in Andalusia (the construction of new motorways and dual carriageways, the implementation of ring roads, improving layout, ...) has, between 1994 and 2008, reduced journey times around 10,5% and improved accessibility, as measured by the layout-speed index on roads[7], at 9.7% and, the most significant in terms of territorial cohesion: the greatest increases in accessibility have been registered in the regions previously least accessible especially in rural and mountain areas.

This means that there has been significant progress in the internal cohesion of Andalusia, to facilitate mobility across such an extensive region, previously so weakly articulated, as well as in improving its relations with neighboring countries and regions: a road network that supports economic activities and social facilities. Regarding social facilities, better ratios of population with access to schools, hospital and/or welfare facilities are obtained. And with respect to economic activities, the road network does its primordial job of channeling population and goods flows, but also helps secure population and economic activities along its route, especially around the network structure, thus contributing to further territorial changes.

4. Territorial balance

In this journey, unavoidably selective and limited within the complexity of what has happened in Andalusia over the last twenty years (more so in an in-depth analysis), and despite initially presupposing the difficulty of grasping significant changes in the territory in this short period of time and despite the idea that territorial changes require longer periods of time to be perceived, however these transformations have been faster and have had a regional impact and effect on other facts and activities that lead us to realize the frailty of human memory (so many changes in such a short time!)

If the analysis goes deeper into the effects of these changes, we cannot avoid thinking about the fragility of the environment or ecosystems affected by human activities, to the extent that the territory receives the impact and effects of such changes.

The land is with human resources, our greatest asset, and from its quality derives much of our potential for development.

This should lead us to conclude the importance of supporting, recognizing and assessing the territorial changes related to, or derived from, the changes of another order, primarily economic. In other words: it is necessary to evaluate territorial changes that could result from other decisions, again primarily economic. The land is with human resources, our greatest asset, and from its quality derives much of our potential for development. ■

6. Regional Government Ministry of Public Works and Housing. Gaugings. Traffic volume rose to 13,316 million of vehicles/km/year in 2007 and fell to 13,181 in 2008 and 12,796 in 2009, an evolution which must be related to the economic crisis.

7. The layout-speed index on roads compares the total travel time over the network from a point to all other territories, with a time reference, which is adopted conventionally as the time that would be spent moving in a straight line (as the crow flies) to the other point, at a rate equal to the average of the network. It is a relative index, which has the virtue of freeing accessibility analysis of the specific geographical location of each point, because obviously the periphery (with respect to others) will always have lower accessibility (measured in absolute units of time, distance, cost, etc.) than those located in "central" areas. Regional Government Ministry of Public Works and Transport, Directorate General of Road Infrastructures (2009) Study of complementary network speeds on roads of Andalusia. Increased territorial accessibility between 1994 and 2008.

Housing in Andalusia, **1990-2010**

Andalusia underwent significant changes between 1990 and 2010. In this period a complete economic cycle was developed between 1997 and 2009. The 1997-2007 period was the longest and most intense housing boom of all those the regional economy has gone through.

Between 1991 and 2008 the increase in housing was more intense in Andalusia (55.4%) than in the whole of Spain (46%), according to the Ministry of Housing. The 4.4 million homes estimated for Andalusia on December, 31, 2008 accounted for 17.5% of the state total. Growth was stronger in the coastal provinces than the interior. The increase in total housing supply was striking in Malaga (78.7%), Almeria (74.6%) and Cadiz (56.1%). The more moderate increases were those of the interior provinces, Jaen (29.2%) and Cordoba (34.5%). The role achieved by housing in the province of Malaga, 1,026,650 households, 23.3% of all Andalusia stands out.

It should be emphasized that between 1997 and 2007 the annual average of housing initiated was 125,200 while the net creation of new households was 64,300. The excess housing over the variation of the households went to second homes bought for investment purposes or that simply did not sell.

The Global Financial Crisis of 2007 concurred with a high dimension of the subsector of residential real estate in Andalusia. This crisis caused a sharp credit crunch, an important decline in employment and a downward revision in housing prices. Between 2007 and 2009 home sales fell in Andalusia (-19% in annual average). Prices fell by 11.9% between the highest and the lowest points, especially in Malaga (-16.8%), Almeria (-14.4%) and Huelva (-13.8%). The decline in prices has been lower in the inland provinces (-6% in Jaen). The housing market adjustment has been based on lower prices and new offer, which has fallen dramatically. There is an apparent surplus of nearly 145,000 homes at the end of 2009, 13.1% of the estimated total for Spain on the same date. Moreover, 27% of the housing in Andalusia is over 30 years old. This justifies large-scale rehabilitation of entire neighborhoods. Increased resource allocation to rehabilitation would reduce the need for an invasion of land for new buildings, an invasion often assumed without sustainable productive activities.

The indispensable rehabilitation of housing makes the construction of new housing to meet demand and maintain jobs in the construction sector less necessary. In the Law on the Right to Housing, 2010, social housing is the key instrument for ensuring that right. Rehabilitating, building new protected homes and facilitating the creation of new productive activities in the territory will require urban planning action consistent with these objectives.■

Julio Rodriguez López
Senior State Statistics on leave

Photo:: Antonio Gaga

Statistics and territory: representational systems

The first two words of the title heading (territory and statistics) refer to an inseparable relationship as all statistical data are associated with a territory. Moreover, "representational systems" refers to a mode of graphic expression of these data directed at the sense of sight that, considering its spatial component leads to its representation in traditional maps, and today, digital representations on the computer screen. It should be emphasized that graphic representations in maps or georeferenced digital images provide additional information to statistical treatment, as, besides facilitating the transmission of information instantaneously (not sequentially), it incorporates new information (not explicitly present in the data) through the analysis of spatial relationships (topological relations). Certainly during the last two decades the unstoppable spread of computer technology, policies to access information by citizens and the Internet environment are dramatically changing the way we produce, disseminate and access these spatial representations of statistical data and all of this will require new challenges to institutional producers.

The first requirement for the spatial representation (analogue or digital) of statistics is the availability of georeferenced data, i.e., incorporating the spatial component (spatial entities to which they are associated in the territory). This has been a key demand in recent decades and is definitely one of the key challenges for the future in relation to the production of statistical data, their representation, dissemination and applied uses. Traditionally collected at administrative level, and exceptionally at a higher level of detail than municipal scale (only in recent years access to spatial data at census tracts level for a variable as critical as the population have been available, for example), most producers are incorporating an intensification of work in this direction into their institutional strategic planning. Technological inputs with the use of GIS and geocoding processes (process to assign data to a territory through a descriptor-address, cadastral reference, kilometre marker ...) will facilitate this process, but will require institutional coordination for the construction, maintenance and standardization of spatial reference baselines that allow these processes to be carried out (spatial data access, administrative agencies, postal codes, digital street maps, etc.). The project CartoCiudad or Digital Andalusian Street Map (in which The Institute of Statistics of Andalusia, IEA, is directly implicated) are projects that moving in this direction.

A second critical aspect for the proper graphical representation is adequate semiologic treatment of these data in maps, atlases and digital representations. Being qualitative, ordinal or quantitative variables, their correct representation requires accurate use of graphic semiology (appropriate use of visual variables in choropleth maps of isolines or proportional symbols among others) and a precise choice of implantation modes (point, line or zone). The difficulties in using the latter (zonal) are well known, very challenging in statistical data associated to administrative units. It is clear that information technologies have provided a huge battery of new semiotic resources of great interest in recent decades (three-dimensional views -2.5 and 3D, cartograms, dynamic maps, flows, etc.). And substantial progress has been made in print or digital editions in recent years (a magnificent example is the National Atlas of Spain and its Information System, SIANE). The challenge for coming years is, undoubtedly, the dissemination of data and spatial representations through the web. Spatial Data Infrastructures (SDI) and the INSPIRE directive are encouraging their standardized progressive incorporation (the use of standards and protocols) and they will require again a great effort of institutional coordination to face the demand for practically real-time data. It is clear that the Internet will facilitate the dissemination, but on the other hand, it will also demand more interactivity with the data and their graphic processing, and even the participation of citizens/users in production or quality control through collaborative Web 2.0 environments. The increasingly assumed importance of the spatial component of statistics and its relevance in the suitable management of basic public services (education,

health, etc.) and private activities (eg geomarketing) exceeds unquestionably its utility for graphic representations although they facilitate its understanding and dissemination. The coordination of the institutions that produce them and, above all, institutions and entities responsible for their dissemination will face these challenges in the future where the Internet is the main access to them.

The political determination to address these challenges and the proper use of geographic technologies to this end will benefit everyone, no doubt.

José Ojeda Zújar
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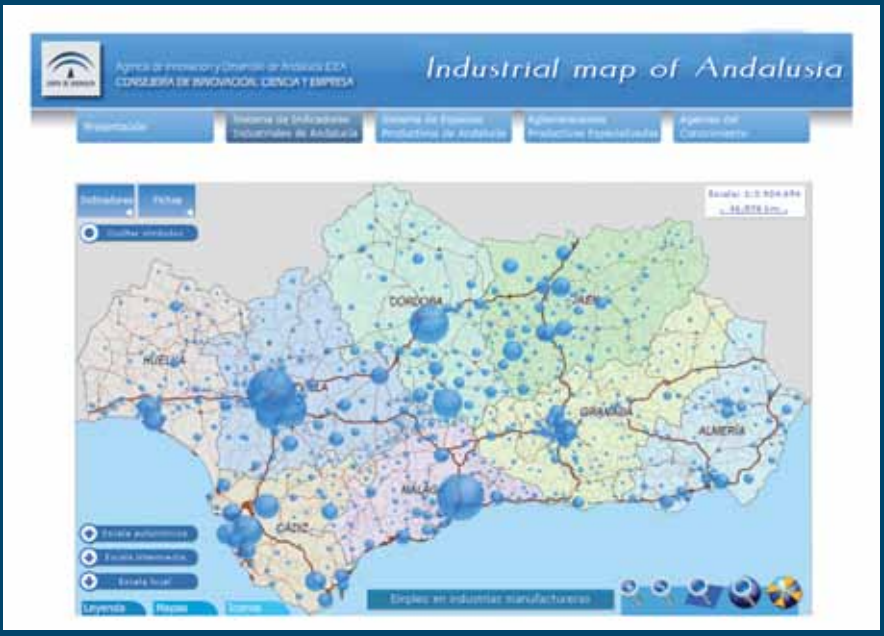
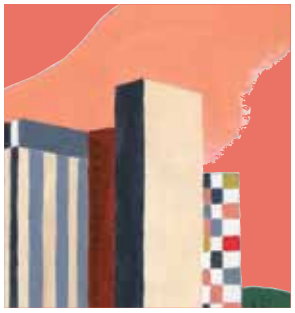


Statistical data Web Viewer of from the Agency for Innovation and Development of Andalusia, developed by the company Geographica Studio in collaboration with the Department of Geography of the University of Seville. It incorporates the use of interoperable services of SDI and provides interactivity to the user for processing semiological data.



Environment and quality of life

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1. Introduction

This article intends to carry out an approximation to the changes that the regional environment has been experiencing, and hence the Andalusian people's quality of life during the last twenty years. This is a period marked by strong economic growth in Andalusia and the adoption by the citizens of behaviour patterns and consumption habits typical of developed societies.

Economic growth was dominated during the nineties by the efforts to overcome the previous developmentalist economic model, which was founded on three main areas: an industry poorly integrated into the regional productive fabric and highly polluting, a tertiary sector dominated by tourism activities with a high rate of land consumption that transformed the landscape and an increasingly intensive agricultural model.

Similarly, increased environmental awareness and demand for a higher quality of life drove the autonomic administration to formalize policies characterized by a greater connection between the productive process and environmental management. This new framework which opened in the nineties has led to great advances in sanitation, waste disposal, air pollution control, fire prevention, protection of natural areas, research and implementation of renewable energy, etc.

However, these achievements have been limited by the relentless process of concentration of the Andalusian population in large cities and the coast. Moreover, we should note the rapid growth of real estate and tourism sectors whose peak was reached in the first decade of the 21st century, and whose consequences have created new imbalances in the environment giving rise to new challenges for environmental policy in connection with the strategies necessary for spatial planning and economic development..

2. Water

In Andalusia, water resources are crucial owing to being scarcer than in other Spanish and European territories, and for generating at the same time greater added value in productive activities such as agriculture, given the multiplying effect of the practice of irrigation in a Mediterranean climate.

In the last few decades the permanent increase of water demand has led to a parallel increase in water deficit which in the last year alone has grown by 245 hm3 with respect to the previous year and stands at 960 hm3. Agriculture requires the greatest amount of water so that it accounted for 77.5% of gross annual demand in 1995 and in 2009 its share was 81.9%. Urban consumption comes behind remaining at around 14% and industrial use, further behind, which is around 3%.

As pointed out by Rodriguez Martinez, in 1997[1], increased water consumption by agriculture has occurred especially in the Guadalquivir valley and in new coastal irrigation, while the traditional irrigation of eastern Andalusia has been abandoned in the mountainous interior. This means, moreover, the intensification of pollution and erosion processes of soils.

Considering the water shortage as one of the major problems in the management of water resources, it must be said that, perhaps, the greatest environmental challenge faced by Andalusia in the early nineties was water quality degradation, both inland and coastal, due to the serious inadequacies in sanitation and water treatment networks.

The development experienced in the last two decades in the treatment of waste water is nevertheless very positive. In 1992, 28% of the pollutant load from urban wastewater was purified. The progressive growth of the WWTP (Waste Water Treatment Plant) increased the pollution load purified to 35% in 1995 to 57% in 2000 and 70% in 2005. In this improvement process treatment plants were provided in sensitive areas, in urban centres and coastal tourist sites. Water treatment in small towns was more underdeveloped, so that recent efforts in water purification have been channelled to that sector, articulating a model based on the designation of multi-municipal bodies to serve their respective territorial areas. As a result it has been possible reach up to 76.9% of the equivalent load refined in 2009.

It is to be expected that in the future (Horizon 2015) the implementation of the National Plan on Water Quality will achieve the wastewater treatment from all population centres over 2,000 inhabitants. All this will contribute to healthy water resources, which is the goal of the Water Framework Directive of the European Union. Quality control is based on a system of indicators for which we do not have long, continuous series but which allow us to mention a few points. Nitrate concentration is one of the parameters used due to its relationship with the presence of agricultural fertilisers and waste water discharges. Available data indicate a significant upward trend in the district of the Guadalquivir and mild upward trend in the Mediterranean district. On the other hand, biological oxygen demand (BOD5), which is an indicator of the concentration of organic pollutants, has undergone a continued decline in the district of the Guadalquivir and an irregular trend in the rest. As for electrical conductivity, reflected by the amount of salt, the Mediterranean district presents the highest values.

Finally, the quality of inland bathing waters has evolved positively over the past 20 years, with a significant increase in the number of sampling points to record high-quality bathing water areas and no sampling point rated "not suitable for swimming" have appeared since 2004.

3. Production and Waste Management

As in Spain and Europe, in Andalusia the increased consumption capacity of the population and the ever more complex supply of products produced and packaged, has meant a considerable increase in the production of urban solid waste (USW) in the last 20 years. If in 1991 the quantity of urban waste was estimated at 2,100,000 tonnes/year and in 2000 3,252,969 tonnes/year in 2009 it amounted to 4,972,247 tonnes/year, without including the waste from construction and demolition, electrical and electronic equipment, etc. If we consider the USW expressed in kg/person/year it is observed that between 1995 and 2009 the figure has doubled, standing now at 603 kg/person/year (1.66 kg/day), above the Spanish and European average.

Contrary to this steady increase in the values of USW production it should be noted that in recent years we have witnessed a reduction in the percentage of waste discharges. The final destination of urban waste in Andalusia has evolved to the extent that the illegal landfills and rubbish tips have been sealed and the treatment system has been improved, conforming the current map of facilities for waste management that includes sorting facilities, transfer stations, recovery and composting plants and a network of recycling points.

1. Martínez Rodríguez, F. (1997): Space and the environment in Andalusia. I Regional Science Congress: Andalusia in the twenty-first century. Statistical Information of Andalusia

Table 1: Treatment of municipal solid waste in Andalusia (%)

Year	Composting	Controlled dumping	Uncontrolled dumping	Recycling	Incineration
2008	56.9	35.0	1.3	6.8	0.0
2004	69.0	28.9	2.1	0.0	0.0
2001	57.1	38.2	4.7	0.0	0.0
2000	55.6	39.8	4.6	0.0	0.0
1995	18.7	57.9	23.0	0.0	0.4
1990	29.5	27.5	42.6	0.0	0.4

Source: Regional Government Ministry of the Environment. Environment Report (various years).

It is clear that, the collection of waste is the most positive management option in the presence of a production and consumption model that continues to increase waste volumes. In this sense, we must stress the importance attached to the recent increase in the volume of selectively collected waste, although still modest, it accounts for 6.8% of the total.

By dividing the amount of packaging waste recovered through separate collection and the quantity of packaging placed on the market, the result is strong growth since 2004, so for that year, the percentage of packaging recovered or the recycling rate was 40.4% for paper and cardboard, 10% for light packaging and 6.2% for glass[2]. Four years later, the rate of recycling of paper and cardboard amounted to 58.4%, light packaging 45.3% and glass 43.3%, so the total rate of recycling of containers now stands at 47.5%, close to the 55% minimum target for the EU for this date.

Given this production, processing and recycling scenario, the challenges for the future must be directed at improving waste management, advancing in the valuation of biogas, increasing the selective collection ratio, including new types of specific domestic waste and increasing the treatment of other waste such as tires, debris or agricultural plastics. But certainly the most important is to work in the field of source reduction of the volume of waste produced, this being a strategy with far fewer accomplishments in spite of the fact that it could avoid environmental impacts that occur during the recycling process.

The new regulatory framework for Andalusia (Non-Hazardous Waste Management Master Plan 2010-2019) includes among its key measures the reduction in the amount of waste produced, improving the selective collection and awareness campaigns.

Another issue in this area is the production of hazardous waste. Looking at the sequence of declared production from 1995 to 2008 it can be observed that it has seen a considerable increase, from 136,104 tonnes to 298,658 tonnes, reflecting both real growth experienced by the volume of this waste, as well as greater control and responsiveness of producers whose statements are adjusted ever closer to reality. Moreover, the latest available data (2008) show a decrease of 6% over the previous year, which brings us back to the figure recorded in 2004. However, the amount of hazardous waste can be classified as high considering the characteristics of most of the business fabric of Andalusia, which leads to the conclusion that the industrial area of Huelva, the Bay of Algeciras, in addition to the metropolitan areas of Seville and Malaga are now concentrating the majority of regional production.

With regard to the management of these wastes, progress has been spectacular, as it has gone from the treatment of 282,814 tonnes in 2004 to 805,931 tonnes in 2008, which means a continued increase in imports of waste from outside the community. Of the total volume of hazardous waste recovered or disposed of in facilities in Andalusia, 22% came from abroad and 33% from other autonomous communities.

2. According to the publication Hitos y tendencias del medio ambiente en Andalucía (Milestones and environmental trends in Andalusia).

Photo:. Javier Andrada

4. Energy

Following the confirmation in 1979 (second oil crisis) that consequences from excessive dependence on hydrocarbons were not circumstantial; Europe launched a series of coordinated projects to seek energy savings by the "simplest" means, the increase of energy efficiency.

Later, the drop in hydrocarbon prices in the 80s was taken as a temporary situation and did not alter the awareness that had enlightened Europe in the previous decade. Moreover, lower petroleum products prices were only implemented against nuclear energy, which saw building projects for new plants paralyzed throughout the decade.

Moreover, in the late eighties evidence was found that seemed to prove the theory of climate change and our country has signed international agreements that obliged it to reduce GHG emissions.

In this context, Andalusia began the two decades, covering the end of the 20th century and the beginning of 21th century, under the umbrella of European and national projects aimed at reducing hydrocarbon consumption without changing a consumer-resource socioeconomic model and without resorting to the shortcut of nuclear energy. The question is whether these premises have been met.

Based on the idea that energy demand is increasing, as befits the post-industrial capitalist development model, where the demands of certain raw materials have given way to the insatiable demand for energy. In our region, which started from very low levels of development, this rapid adaptation to the Spanish and European environment had its counterpart in energy, because our community has the largest increase of energy consumption after the Canary Islands and Aragon, in the period 2005-2007.

Between 1994 and 2008 the increase in primary energy consumption is estimated at 69% in Andalusia. This upward trend is broken between 2007 and 2008 and consumption is reduced by 4.7%. Oil is the source that contributes most to meeting energy consumption, despite its participation being down from 10,380.7 ktoe[3] in 2007 to 9,982.2 ktoe in 2008. Meanwhile, natural gas maintains a steady upward trend from the 1,962 ktoe in 2000 to 6,524.9 ktoe in 2008, which means a growth of 232.5%.

Conversely, coal has maintained a downward trend since 2000 broken temporarily in 2007 to fall back

3. Ktoe: kiloton of oil equivalent.

Photo: Javier Andrada

more strongly in 2008, being reduced in the last year to 1740.5 ktoe.

The growth of renewable energy has been hesitant since 2000, but settled in forcefully in the last two years recording successive increases of 30 and 49%. Thus, with 1610 ktoe, these energy sources make up 7.99% of total consumption contributing to an increased self-sufficiency rate that has now reached 9.1%. This rate is still, however, much lower than the Spanish, which is 21.6%.

The growth of total final energy consumption has been even more pronounced than that of primary energy (108% between 1994 and 2008), which can be attributed largely to a lower energy expenditure in transformation processes, transport and energy distribution, and thus to greater efficiency. As regards the structure of final energy consumption by source, this is very similar to that of primary energy as shown in the table below.

Table 2: Evolution in final energy consumption by source, 1994-2008 (ktoe))

	1994	2000	2004	2007	2008
Petroleum products	4,745	7,374	8,862	9,257	8,894
Electricity	1,752	2,191	2,793	3,144	3,135
Natural gas	380	1,338	1,521	2,360	2,403
Energías renovables	197	649	592	644	751
Coal	226	79	86	36	32

Source: Andalusian Energy Agency.

If we consider the final energy consumption by sector, industry and transport have become the large consumers; the latter is in first position since 2004. Both together sum 71.8% of total consumption. Despite a sharp rise in absolute terms, the residential sector remains at around 12% share in regional energy costs since 2000, while the primary and service sectors have increased their relative position reaching 7.3 and 8.4% respectively.

In this scenario of steady growth in energy consumption there are three main elements that contribute to reduce the environmental impact caused by energy use. First, the energy source consumed has gone from the most polluting fuels to those less harmful to the environment. This is mainly related to the reduced use of coal and the gasification process.

The issue of energy efficiency is the second positive element observed in recent years. Energy intensity or consumption of primary energy per unit of GDP has fallen by 5.4% for the last year, though, considering the period 2000-2008 this indicator has only dropped by 1% compared with 11, 4% in Spain.

The third feature that deserves to be taken into account is the progress of renewable energies, whose penetration rate has now reached 8%, approaching the 12% EU target for 2010. This improvement is mainly due to the growth in the use of biomass, estimated at 60% since 2000, representing 79% of it all renewable. Next follows wind power with 13% after doubling its installed capacity between 2007 and 2008. Solar energy is also experiencing rapid growth, although its contribution is still barely significant.

5. Atmospheric Environment

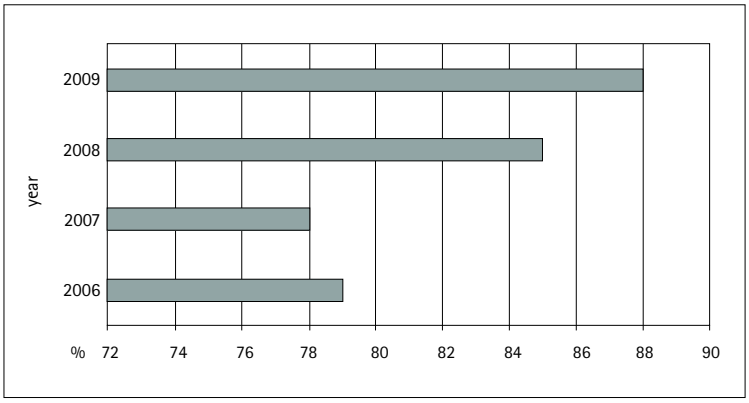
In Andalusia air quality depends mainly on emissions of pollutants from urban centres and in particular the transportation of persons and goods. Moreover, some industrial areas, such as the Bay of Algeciras and Huelva emit large amounts of air pollutants into their environment. To this must be added the secondary pollutants such as tropospheric ozone, which have a great impact on the peripheral areas of large population centres.

Some of the tropospheric ozone precursor gases have not stopped growing since 1990, such as nitrogen oxides which increased by 32% between 1990 and 2004, although further improvement is observed that returns the levels of this gas to 2002 figures. As industrialization and urbanization have grown, and therefore emissions of contaminants, have imposed the need for periodic air quality assessments, which evidence that currently there are contamination levels with adverse effects on health and the environment. Such assessments have been conducted since 2001. In this effort to control and monitor air pollution, the number of stations available in Andalusia has significantly increased, from the 60 working in 1995 to the 100 today.

According to the results of reports from the control network, the main air pollutants are particles smaller than 10 microns, most abundant in Bailen, some municipalities of Cordoba between 50,000 and 250,000 inhabitants, the industrial areas of Huelva and the Bay of Cadiz and major urban agglomerations of Granada and Seville. Ozone values over the target for health protection, are recorded in industrial areas of Huelva, Carboneras, Algeciras and Cadiz Bay, as well as in agglomerations of Granada, Seville, Malaga and the Costa del Sol. Sulphur dioxide (SO2) moves around the recommended limit in the Algeciras Bay and nitrogen dioxide (NO2) in centres between 50,000 and 250.000 inhabitants in Algeciras and in urban areas of Seville and Granada.

However in recent years, it is possible to observe a positive trend in air pollution levels in the whole of Andalusia considering the percentage of days that present admissible air quality values. Based on figures available for that parameter the progression from 2006 to 2009 was as follows:

Figure 1. Percentage of days with acceptable levels of air quality



Source: Regional Government Ministry of the Environment. Environment Report (various years).

On the average values of Andalusia, the areas with the highest number of days exceeding limits for health are Seville and its metropolitan area, Granada and its metropolitan area and the industrial area of Bailen where, however, a very sensitive reduction of the days of not acceptable air quality has been observed, linked to the realization of a plan to improve air quality since 2006.

Other similar plans are running in the Campo de Gibraltar, in the vicinity of Huelva or Villanueva del Arzobispo, while others are being developed in different areas of Andalusia, especially in urban areas where the origin of pollution is particularly related to traffic..

6. Coast

One of the most disturbing issues in environment and quality of life is the current crisis affecting the Andalusian coast. In the coastal areas which had maintained a degree of naturalness until some decades ago, the economic and demographic growth has led to a noticeable deterioration.

The pressure on space and resources is evident in the increasing population density in the coastal municipalities of Andalusia and the expansion of areas urbanized and occupied by various infrastructures. But the coast also accumulates the demand for accommodation in holiday periods, tourism and other competitive economic sectors such as intensive agriculture, the petrochemical industry, aquaculture and renewable energy. This process of concentration of people and activities in the narrow coastal strip leads to cumulative impacts on a small area that maintains, moreover, some of the most valuable and fragile ecosystems of Andalusia.

In 1991, 34% of the population lived on the coast of Andalusia and in 2009 the figure was 38.4%. The average population density is thus 405.3 people per sq km. The increase in population in the coastal area has been particularly important in the last decade, during which there has been over 50% growth in over 25 municipalities. Sun and beach tourism, industrial activity and agriculture under plastic (plasticulture) are the direct causes of this rapid demographic change.

The most significant indicator for estimating the extent of the intense transformations which have occurred in the last two decades on the coast, affecting the environment, quality of life and landscape, is the percentage of man-made landscapes due to the effect of the expansion of urban development and infrastructure construction.

From the disaggregated data provided by the Regional Government Ministry of the Environment on uses and land cover, we have selected those for the coastal municipalities and generated a summary table with the broad categories of uses for the years 1991 - 1995 - 1999 - 2003 - 2007. Examining this data allows us to verify, as the most outstanding issue, that built-up and altered areas have gone up from 5.85% of total land area of the coastal municipalities in the 1991 to 10.10% in 2007.

Table 3: Evolution in land cover in the coastal municipalities

Soil cover (%)	1991	1995	1999	2003	2007
Built up and altered areas	5.85	6.34	6.58	8.32	10.10
Agricultural areas	33.37	33.83	34.33	31.40	31.59
Forest and natural areas	55.57	54.61	53.69	53.81	51.92
Wetlands and water areas	5.21	5.22	5.40	6.47	6.39
	100	100	100	100	100

Source: By the authors from data of the Regional Government Ministry of Environment

Regarding the growth rate, man-made areas have increased by 72.27% since the start date. The province with greater human impact on the coastal landscape is Almeria, where the increase in built-up and altered areas is 123%. Behind it are Cadiz and Granada with an increase of 80% and 71% respectively. In Malaga and Huelva the growth reached is 56% and 51% in each case. The situation of Almeria is the most indicative of the transformation undergone by the natural and forest areas and, given the long survival of coastal areas virtually untouched, while in provinces such as Malaga the human impact on the landscape dates back to the 60s.

The report on land use of the Observatory of Sustainability in Spain measured man-made alteration processes of the coast in the strips from 0 to 5 km, placing the Andalusian coast in the period 1987-2000 among the areas with highest urbanization rates of Spain, only below the extraordinary growth of Valencia and to a lesser distance, the very high rates of the Balearic Islands.

Photo:: Javier Andrada

With regard to farming land, it has been reduced from 33.37% to 31.51%. This figure however hides an environmental fact of vital importance, in view of the fact that the global downturn is derived from the reduction of traditional agriculture and the parallel and accelerated increase of the super-intensive agriculture great consumers of fertilizers, pesticides, plastics, etc. Many of the greenhouses and facilities have been built in natural areas of scrubland, sometimes on very steep hills, and this has caused serious soil erosion due to land clearing, as well as the overexploitation of groundwater.

Meanwhile, forest and natural areas have been reduced; from covering 55.57% of the Andalusian coast to 51.92%. The surface area of natural formations has decreased by 6.75%, losing 30,842 ha, of vegetation cover in coastal towns.

With regard to wetlands and water surfaces an increase of 22.29% has been noticed, that is an additional 9552 ha, occupied mainly by reservoirs and ponds.

As well as the land alteration, and thus the loss of valuable ecosystems, urban and population growth and the concentration of economic activities pose other harmful effects to coastal areas such an increase of the pollutant load discharged to the coast. According to the paper "Hitos y tendencias del medio ambiente en Andalucía (Milestones and environmental tendencies in Andalusia)" (2007), towns are the first source of pollution by dumping on the coast, while organic matter is the main pollutant. We have already discussed the progress on sanitation and water treatment, but there are still areas of coastline that must improve in this respect. The information on the wastewater industry does not allow an analysis of trends, but we can say that the main polluting sources are concentrated in the Polo Quimico (Chemical Area) of Huelva and Cadiz and Algeciras Bays.

In general, the most important pollutant is total organic carbon due to the high urban concentration, but to this must be added, in the case of the coast of Huelva, metals coming from the Polo Quimico, contaminants from intensive agriculture and the pyrites that contaminate sediment with arsenic. Meanwhile, the Atlantic coast of Cadiz concentrates discharges from shipyards, distilleries and the automotive industry. In the Bay of Cadiz pollutants come from the commercial activity of ports, maritime accidents at sea and metal and food industries. Also the large port traffic is a source of pollution in the Bay of Algeciras, next to the discharge of the petrochemical and refining industries, steel, paper and thermal energy. In the Mediterranean the main source of contamination is the tourism industry, with intensive agriculture. Finally, the estuaries of Tinto, Odiel and Guadalquivir, receive discharges bearing metals and acids from the mining industry and others from the vast agricultural valley of the Guadalquivir.

It is important to emphasize the influence of the environmental impacts on the Andalusian coast as a result of maritime accidents at sea involving oil spills. Between 1991 and 2008[4] in Spain there have been 135 oil tanker accidents, of which 54 have occurred in the vicinity of the Andalusian coast. The area with the highest number of accidents in Spain is the area of the Strait of Gibraltar.

In this context, the administration is aware of the need to ensure protection of the natural heritage of the coast with the formulation of the Andalusian Strategy for Integrated Coastal Zone Management, whose technical paper was presented in 2007. This document recognizes the inefficiency of the current model of development and the need to define new criteria for growth that will ensure the preservation of natural resources.

One of the outstanding performances in the effort to address an adequate coastal management policy is the successive approval of different boundary delimitation files for the entire coastline. Today, of the 2,100 km of maritime-terrestrial public domain, 1,772 km are already delimited. ■

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Illustration: B. Moreno

Illustration: B. Moreno

Andalusia facing climate change. 20 years that will, hopefully, change history

Climate change has accelerated in the last 20 years becoming, probably, the greatest environmental "problem" we have faced in the history of humanity. In these 20 years we have begun to realize that what were seen as isolated symptoms that something was wrong, respond to an induced change in the behaviour of natural systems and the climate in particular, caused by human activity since the end of the 19th century, but whose cumulative effects have become more pronounced in recent times.

Reflecting the concern on a global scale was the creation in 1988 of a group of 2,000 scientists appointed by UN member states (known as the IPCC) with the object of elaborating monitoring reports and proposals to assume over various world summits which since 1990 have made the "Climate" of the Earth a priority. Thus, from the first report of this group in 1990 to the current, the fourth in effect (2007), the Summits of Rio de Janeiro (1992), Johannesburg (2002) and numerous meetings of the countries involved have taken place, leading to the signature and ratification of protocols such as Kyoto (signed in 1997 which came into force in 2007), attempting to establish commitments to control emissions of greenhouse gases into the atmosphere that affect all signatories of the protocol.

What statistical data reflect for Andalusia in recent years is an increase in minimum temperatures of about 0.4 ° C per decade and 0.2 ° C maximum temperatures. The scenarios for the middle of this century indicate that average temperatures will rise by 2°C, reaching by the end of the century 3°C. Rainfall has been showing a downward trend in spring and increased annual irregularity, so that since the 80's of the last century droughts are becoming a recurrent and increasingly longer phenomenon. Models of long-term forecast applied to Andalusia by the Ministry of the Environment, indicate a decreasing tendency in rainfall of up to 25% and a growing emphasis on irregularity.

In parallel to the level of global awareness, in Andalusia, from the Junta of Andalusia, the statistical data derived from numerous operations relating to the environment also reflect the same tendency. Thus, the eco-barometer of Andalusia, which began its journey in 2001, revealed that 34.5% the Andalusian population considered climate change as the third global scale environmental problem. Today, the eco-barometer 2010 shows that climate change is considered the first global-scale environmental problem by 53% of Andalusian people and if we add the second problem identified, closely related to the processes of climate change, the hole in the ozone layer, this percentage rose to 95%. This is obviously related with the fact that small signs are beginning to be identified by the population as evidence that this is not a scientific hypothesis but a reality that is starting to affect our lives. Therefore, the presence of species from warmer climates (geranium butterfly, palm beetle, tiger mosquito,...) or the problems associated with dates when things are not what they were (the flowers in the Patios de Cordoba do not bloom to coincide with the traditional date, the swallows put forward their migration, species that do not leave, etc...), as well as the increase of extreme weather and climate events such as heat waves, droughts , floods, are forging a public awareness, along with communication actions of public institutions that facilitate the implementation of absolutely necessary mitigation and adaptation measures.

In this respect, it should be noted that the Andalusian Autonomous government pioneered the implementation of its own climate change strategy. This strategy endorsed in 2002 laid the foundations of what now constitutes the backbone of the activities in public actions to counter the effects of climate change. This is the Andalusian Plan for Climate Action 2007-2012, which includes: a Mitigation Programme in response to the urgent need to reduce net emissions of greenhouse gases in Andalusia, adjusting, as far as possible, to the commitments assumed in the Kyoto Protocol and reducing from 8 tonnes per capita per year to 6.5 in 2012; an Adaptation Programme, derived from the analysis of climate scenario forecasts for the 21st century obtained through the Environmental Information Network of Andalusia, which results in an analysis of sensitivity, vulnerability and impact the different socioeconomic sectors may suffer, proposing measures to adapt to these changes and finally, a Communication and Participation Programme promoting awareness of the need for urgent action. ■

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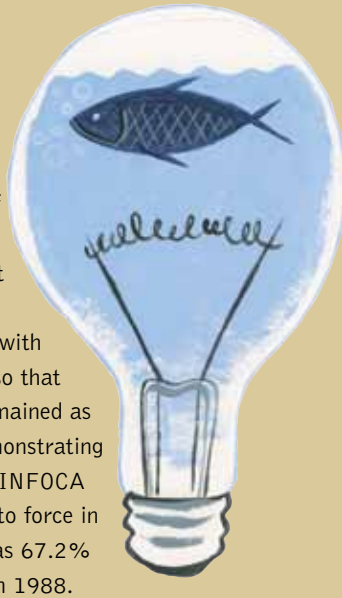
Ecosystems and biodiversity



Observing the evolution experienced by the land use and coverage map of Andalusia, the forest and natural areas have remained stable over the past two decades, spreading over an area slightly greater than 50% of the Andalusian territory. The loss of natural vegetation areas is due to the growth of rain-fed crops and crops under plastic and also the conversion of scrubland into urban areas. Throughout the study period, the urban area and infrastructures have continued to grow from 1.61% (1991) to 3.01% (2007). This increase has occurred at a rapid pace over the past four years, with a variation between 2003 and 2007 of 20.19%.

Considering all the vegetation in Andalusia as referred to in the Andalusian Forest Plan and despite its tendency to stability, there have been small losses in the forested areas mainly due to the elimination of the masses of eucalyptus and the fires that affect particularly pine forests. In both cases the losses are related to anthropogenic processes and not the natural evolution of the plant masses. Although there is some compensation attributable to reforestation and restoration, the final balance yields a smaller area of 12,543 wooded ha, between 1999 and 2003 and 50,366 ha, between 2003 and 2007.

Recent recognition of the role of forests and, in general, of vegetation with respect to their ecological functions leads to the fact that restoration of degraded ecosystems and erosion control have been a priority of the Forest Plan of Andalusia (FPA), since its initiation.

Development between 1990 and 2006 has been evaluated in the third adequacy document of the Plan (Horizon 2015). The paper estimated the reforestation carried out in public forests at 198,462.47 ha, adding another 147,553.57 ha, of reforestation of agricultural land that have benefited from subsidies under the Common Agricultural Policy of the EU since 1992. In general these reforestation and restoration actions have introduced a greater proportion of hardwood, while in the decade prior to FPA it was 1 leafy to 6 conifers, adjusting to 1:1 in 1995. Within the same philosophy the cessation of the use of eucalyptus as a reforestation species for public forests and the implementation in 2004 of an action plan to transform the eucalyptus trees into mixed stands of native species must be understood. Advancing this line of diversification and reintroduction of native climacic or sub-climacic species, means nowadays the employment more than 40 different species compared with 10 in the early nineties. In parallel reforestation models have progressed to the application of techniques of zero or low environmental impact. The main threats the plant masses of Andalusia and in particular forests face are forest fires. Figures on areas burned are highly variable from year to year, however, starting from very high levels with a peak of 67,578 ha, in 1991, the area affected by fire was kept to low to moderate levels from 1996 to 2002, again showing a peak in 2004 with 43,021 ha, and descending to 2,266 ha, burned in 2008. This positive trend of recent years was broken in 2009 with 12,199 ha, affected and 1,017 fires, 807 of which did not go beyond arson attempts as a result of the INFOCA Plan.

However, despite the upturn in the last year, considering all the last decade, it yields lower figures than the nineties. The area affected by each fire had reached a very satisfactory value in 2008 with only 2.93 ha; nonetheless last year's data were considerably worse with 11.9 ha, affected in each incident. In terms of prevention it should be stressed in recent years the number of attempts compared with fires has increased so that 75-80% of fires remained as arson attempts, demonstrating the effectiveness of INFOCA Plan which came into force in 1993. This figure was 67.2% in 1992 and 56% in 1988.

Focusing on the biodiversity of flora and fauna of Andalusia, there exist an outstanding level of wildlife resources and an exceptional inventory of vascular plants. Over the past 20 years, interest in this heritage and their conservation needs have resulted in, among other actions, the elaboration of the Andalusian Catalogue of Endangered Species of Wild Flora 1994 and in its 2003 revision; the Autonomous Community now counts on continuously updated information.

Effective conservation actions are specified in the implementation of many recovery programmes for endangered flora, in the consolidation network of botanical gardens (11), in the creation of the Germplasm bank regulated since 1994, preserving seeds of 364 taxons and the operation of the plant propagating laboratory for the last seven years.

As for local fauna the situation of some emblematic species which are systematically monitored, as is the case of cetaceans and seabirds, the Iberian lynx and native crayfish should be highlighted. The Lynx has enjoyed a significant recovery in the number of territorial females since 2001 (31-32 females) to 2009 (58 females) and the number of young has risen from at least 12 to a minimum of 69. ■

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Nature PROTECTION areas

The rich, geological and scenic biodiversity of Andalusia encouraged the adoption of the Law 2/89 on Inventory of Protected Areas of Andalusia. This opened an important field of environmental action to the public sector: a series of valuable spaces are provided with planning and management tools to make nature conservation compatible with the use of resources and economic development.

In 1989, the Inventory of Protected Areas of Andalusia was made up of a National Park (Doñana), 22 Natural Parks and 59 Natural Sites, with a protected area of 1,497,195.2 ha, 17.10% of the Andalusian territory . The protected areas have continued to grow in number of hectares and protective measures from this date, so that by 2002 18.50% of the regional territory was already protected and in 2009 the area had reached 1,767,458.49 ha, that is, 20.17% of the territory.

With the declaration of Sierra Nevada there were two National Parks, two other Natural Parks also joined the network and all other protected areas and the rest are organised today in Nature Reserves, Natural Sites, Protected Landscapes, Natural Monuments, Periurban Parks and Nature Reserves added to which there are the Sites of Community Importance (SCI) which in Andalusia coincide with Special Protection Areas for Birds (SPAB).

Internationally we can highlight the inclusion of 25 wetlands in the Ramsar List, the declaration of 9 Biosphere Reserves (UNESCO MAB), 4 Specially Protected Areas of Mediterranean Importance (SPAMI, Barcelona Convention), 2 Geoparks (UNESCO) and World Heritage Area (UNESCO). Finally, the Network of Protected Natural Areas in Andalusia (NPNA) is the first European regional network by number and surface area of Protected Areas.

Among the various management tools for protected areas, public use is of great interest, being the answer to citizen's demands for the enjoyment of these spaces and at the same time, if emphasis is placed on environmental education and interpretation of heritage, furthers nature conservation. Well planned programming of public use makes it possible to adapt the services offered to visitor capacity, channel public attitudes to nature positively and engage the visitor in the needs of the protected area and so on.

In Andalusia a strong impetus has been given to public use, both for the evolution registered in the equipment and for the development of the latest visit programmes. In 1990, only 3 protected areas enjoyed basic equipment, while in 2005 all the Nature Reserves had this basic network, including a total number of facilities of 668. This number has continued rising to 779 in 2009.

Of all the public use facilities, 65 reception and information centres, 184 playgrounds, 137 observation points, 360 trails, 13 nature classrooms and 11 botanical gardens stand out.■

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Photo:: Antonio Gaga

Society

The Andalusian population in 2010 is 8.35 million, 1.25 more than in 1990.

The population density is 95.4 people per sq km, 14 people more than 20 years ago.

The number of households has grown in 20 years from 1.8 million to 2.9 in 2009.

The average age in Andalusia has risen in this period from 34.2 to 39.0 years, and is still younger than the Spanish average.

The weight of the foreign population has increased from 0.89% in 1990 to 8.36% in 2010.

Demographic indicators of Andalusia.

	1990	2009
Average age at first marriage		
Men	27.0	31.2
Women	24.9	29.3
Average age at first child (female)	26.1	29.0
Average number of children per woman	1.7	1.5
Number of births per 1000 population	12.9	11,5
Population under 15 years (%)	22.8	16.2
Population over 64 years (%)	11.7	15.0

The Andalusian population, Situation and major changes

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Key features of the recent past of the Andalusian population are, in general, the behaviour of the Spanish population: sustained population growth, progressive ageing, massive influx of foreign population, a rise in fertility after the downturn from the beginning of the last quarter of the 20th century, new types of partnership and their dissolution, increased life expectancy and increased residential mobility. All this leads to changes in the population structure, in the spatial distribution and dynamics of growth, territorial settlements, fertility, marriage and mortality.

1. Population

According to the latest official population figures1 Andalusia has 8,353,843 inhabitants, 17.79% of the Spanish population. It is the most populated autonomous community. The relative weight of the Andalusian population compared with Spain has declined in recent years (in 2000 it accounted for 18.12%). There has been a redistribution that has changed the relative weight of the population of each province over the population of the Community. Two provinces have increased their relative weight, Malaga and Almeria at the expense of the remaining six. Malaga gained almost two percentage points between 1996 and 2010, from 17.27% in 1996 to 19.23% in 2010. Meanwhile, Almeria gained 1.37 (from 6.94% in 1996 to 8.31%, in 2010). The provinces that lost most relative weight in the period, are Jaen (-0.96%), Cordoba (-0.89%) and Cadiz (-0.45%).

Andalusia has a younger population than most of the Spanish regions. The average age of the Andalusian population stands at 39.04 years in 2009, almost two years less than the average age of the Spanish population. Andalusia, together with the Canaries and Murcia are the Autonomous Communities which have the youngest population in Spain and this difference has been maintained for decades.

2. Structure

The current population of Andalusia has more young and fewer elderly people than Spain. The latest official population figures indicate the number of seniors2 in Spain stood at 7,929,269 (16.8% of the total population, one in six people), more than four million people (8, 65%) of 75 or over, and the population aged 84 and over has exceeded one million (2.22%). The figures for these same groups in Andalusia are 1,250,622 (14.97%) 602, 726 (7.21%) and 136,860 (1.64%). Each of the three age groups therefore has a greater weight in Spain than in Andalusia. However, each year in Spain and in Andalusia the relative weight and the absolute number of the elderly population grows, suggesting that in the coming years the seniors of our community will come to be all the more important. The group of people of working age has a similar weight in both areas; slightly favourable to Andalusia (68.8% and 68.4 in Spain).

Andalusia has a bigger younger than senior population while in Spain the opposite is true, this being an important

1. Municipal register of inhabitants 01.01.2010, advanced data. (Hereafter latest figures)..

2. In this document seniors are people of 65 years and over, younger under 15 years.

Table 1. Population of Spain and Andalusia. Main age groups.

		<15 years old	15-64 years old	>64 years old
Spain	People	6,906,433	32,115,830	7,929,269
	% Population	14.71	68.40	16.89
Andalusia	People	1,356,870	5,746,351	1,250,622
	% Population	16.24	68.79	14.97

Source: INE. Municipal register.

distinguishing feature in the current age structures of the two populations. With respect to ageing Spain now has one million more seniors than young people (16.89% seniors and 14.71% young). By contrast, in Andalusia the number of young people outnumbers in more than a hundred thousand the senior population (14.97% senior and 16.24% young). The above mentioned situation does not occur widely in all the provinces of Andalusia, only five of the eight. Cordoba, Jaen and Granada have more seniors than youths. Both in Andalusia as a whole and all its provinces have a greater younger than senior male population, while there are more senior than young women in the whole of Andalusia and in six of the eight provinces.

Andalusia has a bigger younger than senior population while in Spain the opposite is true, this being an important distinguishing feature in the current age structures of the two populations

In the Andalusian population, just like the Spanish and that of other demographically developed countries, we are witnessing a gradual ageing process. As is known, ageing is caused by a reduction of young people due to an increase of old people and also due to more people reaching maximum ages. To calculate the average age, these three reasons should be considered together. In this sense it should be pointed out that the average age of the Andalusian population has increased by about five years in the last twenty, currently standing at over 39 years of age, as already mentioned.

Andalusia has, according to latest figures, 1,356,870 people under 15 years, which represents 16.24% of the total population. The relative weight was 22.84% in 1991 and 16.51% in 2004, showing a decrease in its relative weight over the total population of Andalusia. Spain has 14.71%, which means a weight percentage of the young population in favour of Andalusia. The largest rates (over 16%) are in the provinces of Seville, Almeria, Cadiz and Malaga.

As noted, people aged 65 and over represent 14.97% of the population of Andalusia. The relative weight was 11.72% in 1991 and 10.6% in 1986 having increased by more than 3% of the total population of Andalusia in the last two decades and about 5% in the last quarter of a century. They make up a group that, in general, is not longer part of the workforce, moreover many of them are in good health and require new occupations and activities to which the organisation of society must respond.

The age group aged 85 and over, "the oldest old' is acquiring greater relevance as a result of the increasing number of people reaching these ages. This is a group of people who, in general, require special care due to a decline in their physical and psychological qualities and their greater dependence. At national level they represent 2.22% of the total population, over a million people, in Andalusia 1.64% over 135,000 people. In 1991 there were in Andalusia alone 60,801 people aged 85 years or over representing 0.88% of its population. Women predominate because of their greater life expectancy.

As for the distribution of people in the territory, the weights of the age groups considered above are related to the population size of the municipality. In general, smaller municipalities have a lower percentage of young and higher of elder people.

3. Growth

The Andalusian population in the last year grew faster than that of Spain. However, the average annual Andalusian population growth rates in the period 1990-2010, was similar to that of Spain, around 8.15 people per 1000 population. In the early years of this century, growth was higher in Spain, producing then a convergence; with last year's figures, growth in Andalusia outstripped Spain (6.1 ‰ vs. 4.4 ‰). In this last year, only five regions grew at a consistently higher rate than Andalusia. In recent years, almost three quarters of the Andalusian population growth was due to net migration. Highlighting the growth rates of Almeria and Malaga, 26.2 ‰ and 21.4 ‰, provinces where the foreign population mostly established residence. In Malaga net migration exceeded fivefold the natural growth and in Almeria it was more than four times.

Last year, 2009, presents a new situation where, for the first time, the natural increase outnumbers migration despite the declining number of births and the natural growth of this year. Net immigration has had an even sharper decline. This occurred both in Andalusia and Spain. It remains to be seen whether this is a temporary situation or, conversely, a new beginning in the population behaviour of our country linked to the current opportunities that foreigners can find.

4. Arrival of foreign population

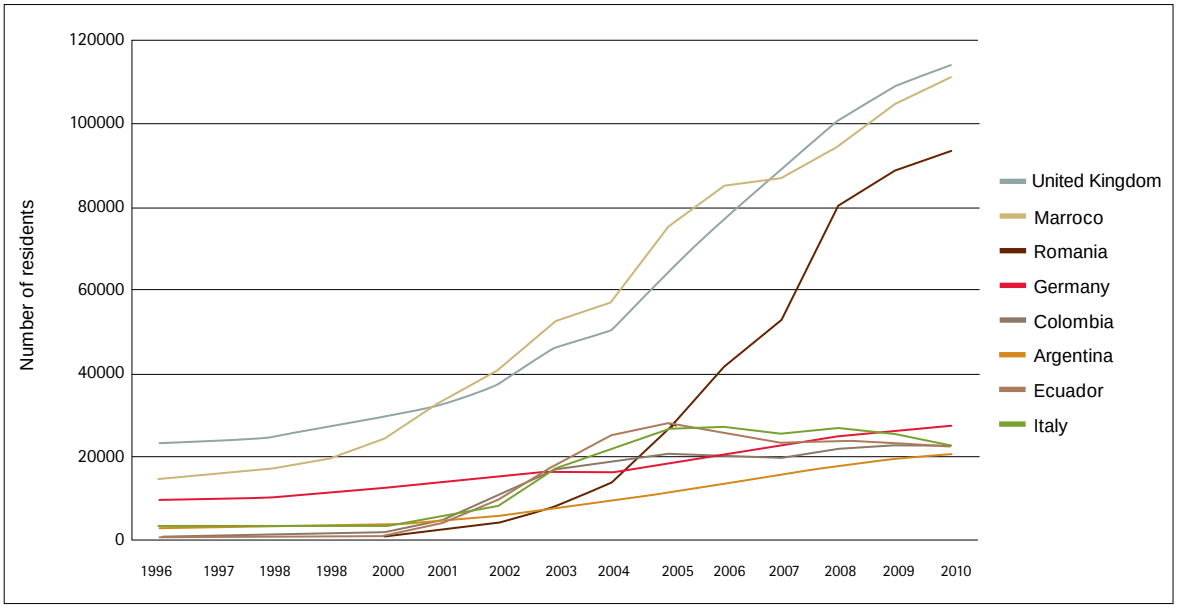
It is a known fact that Spain has moved in the last six decades from being a country of emigration, to being the recipient of many other nationalities who establish residence in Spain. Andalusia participates in this dynamic. 61,985 foreigners according to the 1991 census (0.89% of total population) and has 698 375 (8.4% of the population) according to the advance data of the 2010 census. Despite this increase, the percentage of foreign population is less than that of Spain, which is 12.2%.

The level of development and the labour, social, environmental and climatic characteristics, among others, have brought two main groups of people to reside in our community: those that establish their residence here because of the quality of life, made up basically of people outside the labour force and another group that does so in search of work. In general, the first group, composed mainly of British and German people, are advanced middle-age, around 50, while the second, consisting mostly of people of working age, is a younger group, in which Romanian, Moroccan, African and Latin American nationalities are predominant.

UK, Morocco and Romania provide 45% of the people of foreign nationality residing in Andalusia, if we add the Germans it goes up to 50%. The British are the largest group of foreign residents with 113,440 people settled mainly in the province of Malaga and is also the majority group of foreigners in Cadiz. In the six remaining provinces, the two most numerous are Romanians and Moroccans. The latest figures point to Malaga and Almeria as the provinces with the largest number of foreigners. Malaga has 39.1% of all foreign residents in Andalusia and Almeria 21.5%, so more than six out of ten foreign residents in Andalusia live in these provinces. At the other extreme, Jaen and Cordoba, have the least at 2.9% and 3.6% respectively.

The foreign population comes to Andalusia, mainly in search of work. They supply labour and help of the rejuvenation of the population structure or slow down ageing. They mostly come to Andalusia in working age and offer a considerable injection of labour force; the percentage of Spanish population of working age in Andalusia is 66.9%, while the foreign born population is 76.5%. The group of advanced old age is also lower, only 9% compared with 15.5%. Population pyramids show clearly the greater weight of the foreign population aged 20 to 45, of utmost importance in labour and reproductive activities. But also, babies born to foreign parents are contributing to rejuvenate the structure widening the base of the pyramid.

Figure 1. Evolution of the number of foreign born people in Andalusia by nationality that contribute the most. 1996-2010.

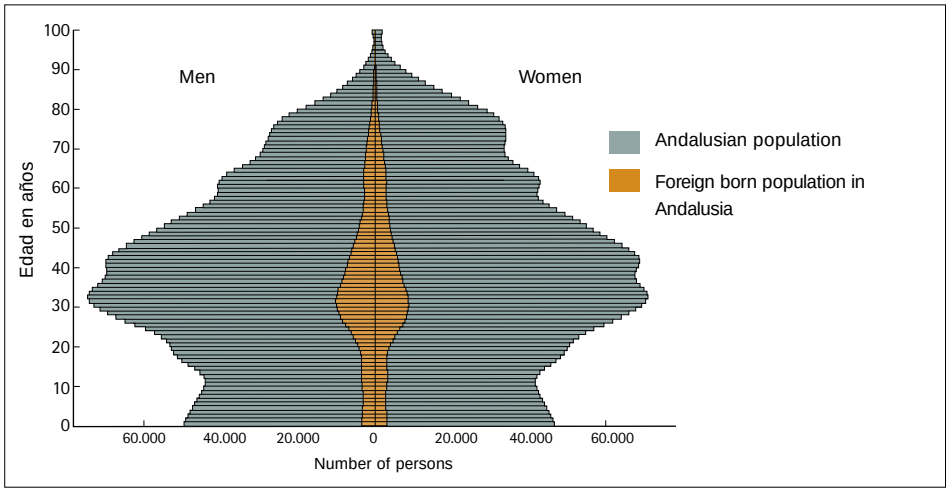


Source: INE. Statistical exploitation of registers 2000-2009. Advance of the municipal register 2010. By authors.

5. Fertility

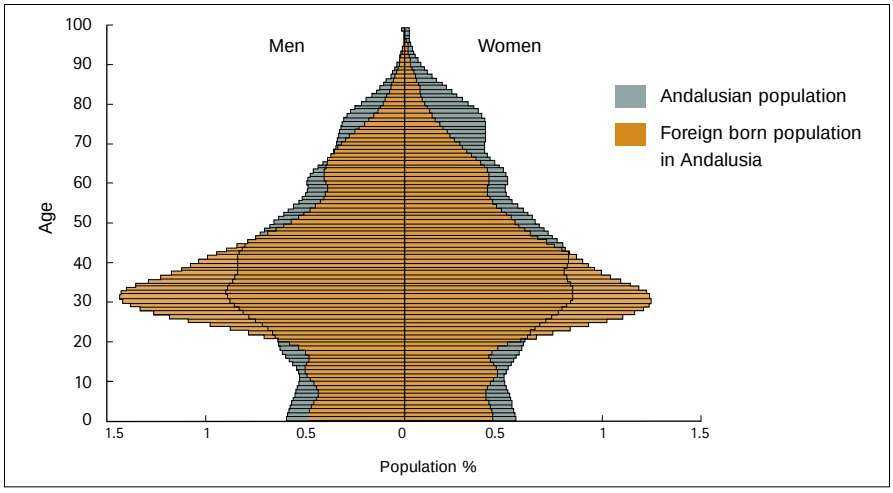
An important feature in Andalusia and Spain in recent years is the recovery in fertility. Births in Andalusia reached their maximum in 1976, with more than 120,000 births that year. Since then there has been a decline that continued until the minimum of 77,000 births in 1996, followed by a continuous recovery reaching more than one hundred thousand in 2008. 2009 figures, the latest available, also show a break in the trend of births to below 95,000. Between 1996 and 2008 the total fertility rate, children per woman, went from 1.33 to 1.57 in 2009 down to 1.47. For Andalusia between 1996 and 2008 there was a 30% recovery in number of births. In this recovery Almeria exceeds 60%; the increase is rela-

Figure 2. Total population of Andalusia and foreign born population in Andalusia.



Source: INE. Municipal register 2010.

Figure 3. Total population of Andalusia and foreign born population in Andalusia (%).



Source: INE. Municipal register 2010.

ted with the young age of the mothers and with a great number of those born to foreign mothers.

Another important feature is the role of the foreign born population in this recovery. In Andalusia, in 1996, 2,675 newborns had at least one foreign born parent. In 2008, there were 15,725 almost six times the previous number. The upward trend3 continues although it is still below Spanish levels where, in 2008, 25.2% of newborn had at least one foreign born parent, and 15.7% in Andalusia. The proportion is not uniform in the community; Almeria stands out with one in three newborns having at least one foreign born parent and, at the other extreme, Jaen and Cordoba around 8%. The contribution of the foreign born population to fertility can be expected to continue, given that there are about two million foreign women of childbearing age in Spain and more than two hundred thousand in Andalusia.

New forms of partnership and cohabitation among couples have also brought an increase in the number of births to unmarried mothers, a fact similar to the pattern of other countries. In 2009, nearly one third of those born in Andalusia were to unmarried mothers, a value slightly lower than in Spain, where one in three births occur out of wedlock.

The dramatic decline in births of the second child and posterior has led to the loss of prominence of large families. The situation in 1975, where the first and second children accounted for 60% of births has given way to the current situation, where nine in ten are first or second born children.

6. Mortality

The steady increase in life expectancy of the population is another key feature of demographic changes in Andalusia. It is now established at around 83 years for women and close to 77 for men. Since the beginning of the nineties there has been a gain of close to four years in this indicator. The difference of six years for women still remains, not the convergence that some people thought would happen.

Despite the increase indicated, the life expectancy of the population of Andalusia is lower than that of Spain. The latest figures for 2008 show 1.29 years for the total population, 1.24 for men and 1.31 for

3. Although the 2009 advanced figures for Andalusia establish the newborn to at least one foreign born parent in 11,682, in line with the decline occurred in the total number of births in Andalusia and Spain.

women. These differences have been increasing slightly in recent years. Adult mortality is higher in Andalusia, there has been a drastic decrease in infant mortality (8.93 ‰ in 1990 and 3.83 ‰ in 2008), as in the rest of Spain, although it remains higher than the national (7.6 ‰ in 1990 and 3.35‰ in 2008). This indicator has reached the level of demographically developed countries, mortality is moving therefore towards old ages, in which chronic and degenerative diseases have replaced infectious diseases as the leading cause of death. Thus, the biggest gains in life expectancy have occurred in old ages; of the four more years mentioned, two were in the range of 65 and over. This population had, in 2008, a life expectancy of 16.9 years for men and 20.6 for women.

7. Marriage

The forms of coexistence and partnership have also experienced major changes. The increasing number of couples living together without legally formalizing the relationship, same sex unions and dissolutions through divorce or separation are factors that have transformed the traditional marriage market. The participation of the foreign born population in marriage and its progressive increase is another important feature of marriage trends in Andalusia in recent years.

Same-sex marriages have registered an increase, 533 in 2008 in Andalusia, 338 between men and 195 between women; 407 in 2009. The celebration of traditional marriages have also changed, from a situation where most marriages were held according to Catholic rite to another in which more than four in ten are civil marriages, the ratio rises to 55% in Malaga and 50% in Almeria. The previous marital status of the spouses underwent a transformation, after the establishment of divorce in our country, from marriages typically between bachelors to another where one partner is divorced. In 2009 remarried couples accounted for approximately 12% of all marriages. In 2009 12% of marriages involved the remarriage of one or both partners.

Divorce has also entered marital dynamics, since its legal implementation it has experienced significant growth. In Andalusia, the number grew steadily to over

Photo:: Antonio Gaga

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20,000 per year; it experienced a temporally stabilisation and subsequent downturn to more than 17,000 in 2009, more than one divorce for every two opposite-sex marriages.

Marriages in Andalusia experienced another change with the participation of the foreign born population. With the massive influx of foreigners and their incorporation into the Andalusian population dynamics in 1994 around a thousand marriages to a foreign partner were held. In 2009, the number increased to five thousand and one in six with at least one foreign partner. In those provinces with a higher ratio of foreign-born population the fact is more evident, as in Malaga where the proportion is 30.2% or Almeria 26.7%.

8. Final Balance

By way of conclusion important transformations that have occurred and are occurring in the Andalusian population can be highlighted. Firstly, the incorporation of large numbers of people of other nationalities who establish residence in Andalusia have an impact on the population size and structure, on the pattern and intensity of fertility, on marriage as a form of integration and in the supply of labour force to the work market or on demand for leisure places and activities, depending on the circumstances. There has been a slowdown in arrival rates, especially in the last year, which affects different nationalities unevenly, and future behaviour still remains to be seen in the current economic situation.

The ageing process common in demographically advanced societies should also be stressed. In Andalusia a certain time lag occurs with respect to Spain, due to the younger structure of the population; nevertheless, in the face of this inexorable phenomenon, society must meet the needs of the population to facilitate activities to our healthy elders and care for their dependency needs.

There have been substantial improvements in life expectancy and infant mortality and these are expected to continue, even though differences remain with respect to the overall performance of Spain.

Finally, the figures for 2009 define a number of uncertainties regarding the future behaviour of some aspects; in addition to what is described about the arrival of foreigners, for the first time since 1996 births and fertility rates and the number of marriages have been declining, natural growth although positive and one of the highest of the autonomous communities is lower than the previous three years. It remains to be seen whether these are structural events or the start of new behaviours in future demographic components. ■

Social change in Andalusia: analysis through public opinion

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It is commonplace to illustrate all kinds of changes that have occurred in the Andalusian society since the restoration of democracy to the present day, concentrated mainly in the last twenty years. It is a self-evident fact that those returning to Andalusia after some time since their last visit become aware of just by looking around. There has been a rapid change in a relatively brief time, which has affected almost every aspect. The most visible are, undoubtedly, material changes identified in the infrastructures, equipment and services provided. The external appearance of Andalusia has changed so much that almost nothing seems today what it was. The transformations have not been less in the social and cultural aspects, although it is more difficult to understand them and a greater effort has to be made to perceive them. The intensity of change has been such that at times it obscures the less dynamic elements, processes not completed or persisting past situations, aspects that must be taken into account to fully appreciate the extent of the transformation that Andalusian society has undergone.

Luckily we have large databases to help analyze this, thanks to the work of many people and institutions, in particular the Institute of Statistics of Andalusia (IEA) and the Institute for Advanced Social Studies (IESA) in the field of public opinion. However, what is more complex is not to describe the change through the data, although this is essential, but to find a framework to give them meaning.

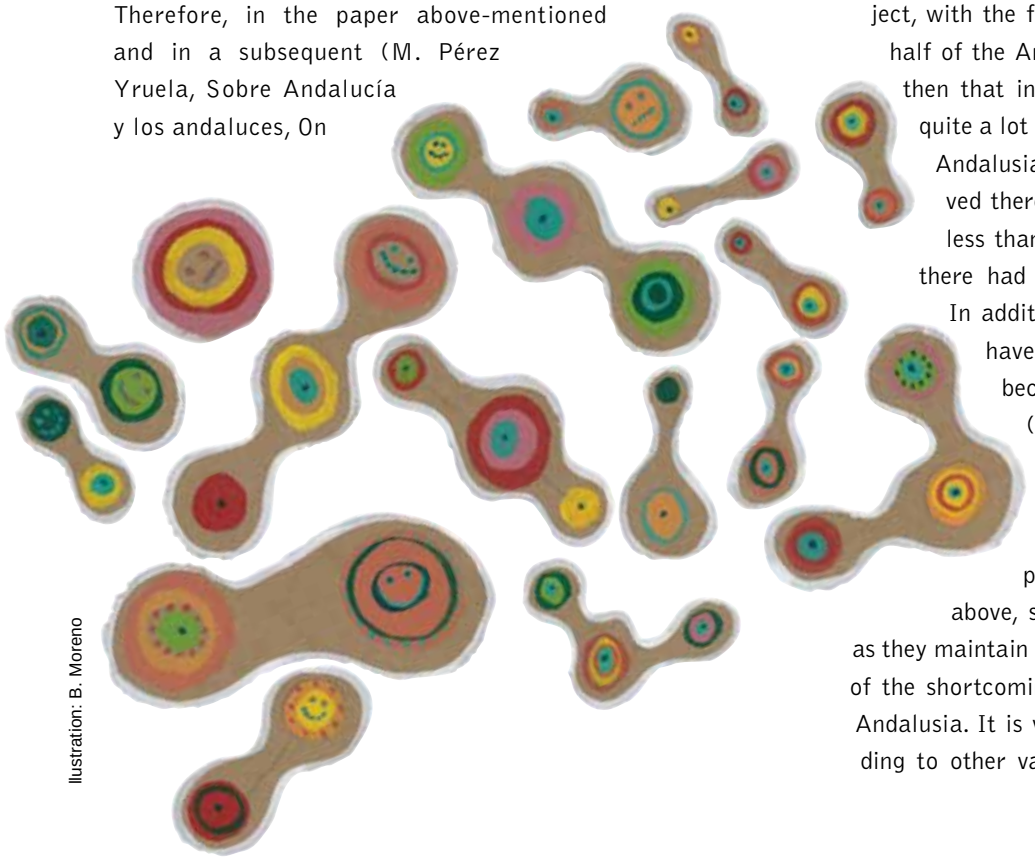
At the beginning of the transition the framework that gave meaning to the way many perceived Andalusia and the data used for this was our relative backwardness and low level of development in relation to other areas of Spain and Europe. It was a framework focused mostly in the large differences that we still had with respect to them. This vision of Andalusia today makes no sense. In a paper published in 2002 entitled «Para una nueva teoría de Andalucía (Towards a new theory of Andalusia)» (M. Pérez Yruela, 2002) I insisted on the idea that the situation of Andalusia had already changed so much that it could be said it was normalized with respect to its environment. That is, Andalusian society no longer had the unique problems that distinguished it from the others, but shared with them similar problems faced by developed societies. Not that there were no differences. There were, but the resemblance was much more important than the differences. Furthermore, these differences did not have the same importance in all cases. It was necessary therefore to develop a new theory of Andalusia that would explain and describe it as a modern developed society far from those features of the past. The uniqueness would now be something very different. It would be about describing and explaining how the remaining differences affect or how important they are in the process of general modernization of the Andalusian society.

This conclusion could be reached by just seeing how those most basic aspects in which Andalusia was comparatively quite backward had been overcome in the first twenty years since the beginning of the transition. By that time, communications infrastructure, large public service facilities such as health and education at all levels, social services, youth schooling, expanding access to university education and so many other aspects that are plain to see as I said at the beginning were already covered. However, the cultural situation was different, because the effects of some changes take longer to materialize, for example, in education, whose impact is noticeable when generations with better education levels reach maturity, also cultural changes, which are usually slower. On the other hand, in Andalusia such rapid transformation has implied that generations with very different experiences and also different capacities to assimilate the changes live together. In addition, some of the most important problems of the past of the Andalusian society, which today have been resolved or have disappeared, have left consequences that still affect us.

Therefore, in the paper above-mentioned and in a subsequent (M. Pérez Yruela, Sobre Andalucía y los andaluces, On Andalusia and Andalusian people, 2004) I argued that an interesting framework for understanding change in Andalusian society is one that takes into account the unique complexity of the Andalusian society today. Complexity and uniqueness resulting from the coexistence of generations and situations in which the modernization that we have experienced, the differences we still have with respect to our environment and existing longstanding issues intertwine. One way to incorporate these complexities is to examine how the Andalusian people perceive this process of change and some of the most important aspects related to it. To do this I will use data from opinion surveys conducted over the past two decades by the Institute for Advanced Social Studies (IESA), the Institute of Statistics of Andalusia and some other institutions.

1. An intense but unfinished change

The Andalusian people have perceived the intensity of change in recent decades. The Public Opinion Barometer of Andalusia (BOPA) elaborated by IESA, 2003 included several questions on this subject, with the following results. Just over half of the Andalusians (55%) thought then that in the last decade many or quite a lot of changes had occurred in Andalusia. A quarter (25%) believed there had only been a few and less than one fifth (16%) thought there had been few or no changes. In addition, the Andalusian public have an opinion on the subject, because only a small minority (4.5%) said they did not know what to think. The perception of change is slightly stronger among people 60 years of age and above, something easily explained as they maintain the best historical memory of the shortcomings that always existed in Andalusia. It is virtually unchanged according to other variables such as education



Ilustration: B. Moreno

level, size of municipality of residence or ideological position. It is therefore a cross-perception of most of Andalusians, regardless of their characteristics, except age. These changes are attributed to the action of, in this order, the Junta of Andalusia (6.82 on a scale of 0 to 10), municipalities (6.4) and the Spanish Government (6.22), the education system (5.96) and entrepreneur (5.74).

According to data from this survey, this perception is of an unfinished change because much remains to be done. Indeed, more Andalusian people (83%) than those who say that things have changed say that there are many or quite a lot of changes to be carried out to solve the problems we still have and to catch up with the most developed regions of Europe. This view is somewhat less pronounced among those over 60, but increases with education level and is also slightly higher among those living in larger cities.

In these years in Andalusia a climate of awareness has been established about our identity, our political system and on relations between them.

This perception that we are a society in progress but which still has some way to go emerges more or less directly in other expressions of public opinion. Among the positive aspects that reflect the progress of Andalusian society is that of political culture. According to all available data the last two decades have consolidated the most important patterns that define the political culture of Andalusia.

2. Politics and public policy

In these years in Andalusia a climate of awareness has been established about our identity, our political system and on relations between them. A great majority of andalusians[1] think of Andalusia as a region and not as a nation (over 85%) and feel as Andalusian as Spanish (76.7%). This is based on the affirmation which has been present among Andalusians for years (57%) of a strong sense of belonging to Andalusia but not nationalistic, with its own character not reactive to other regions (63%).

Andalusians think that the best model is the current state with Autonomous Communities (76.8%) and to a lesser extent, would prefer Andalusia to have more autonomy (between 40 and 50%). Moreover, almost two thirds of Andalusians consider that the autonomy has been beneficial and judge the government of the Community better than the government of Spain in terms of transparency and efficiency in management[2]. It is a widely established political culture, unique in Spain, which has provided Andalusia with a particular role in the national political scene and has implications for Andalusian society and politics, all aspects which cannot be developed here.

Democracy has reached in Andalusia, just as in the rest of Spain, a high general or diffuse legitimacy and low to medium specific legitimacy. The vast majority of Andalusians (over 85 percent) believe it is the best political system in comparison with others. At the same time, between forty and fifty percent tended to believe that they are very or fairly satisfied with the present running (specific legitimacy) of democracy in our region, which would result in a low pass mark on a scale of 0 to 10. Similar to the rest of Spain, whose performance we believe looks very much like ours. Two thirds of Andalusians say that regional democracy works like national democracy.

The overall legitimacy is founded on the belief in the very values of democracy (freedom, rule of law and redistribution) and especially in the view that democracy facilitates the reduction of inequalities (55%). The discontent behind the low valuation of the specific legitimacy extends to many aspects, the distrust in equal treatment by the judicial system, the low valuation of political parties and the inability the citizens say they feel to influence and control politics and their own inhibition in public affairs,

1. BOPAs 1997, 2001 and 2005.
2. The valuation of the various regional governments can be seen in the study Atribución ciudadana deresponsabilidades políticas (Assignment of political responsibilities by the citizens), elaborated in 2007 in Andalusia, Castilla-Leon, Catalonia, Galicia and the Basque Country, through a collaboration agreement between the IESA, CIS (Center for Sociological Research), Pi and Sunyer foundation and the Galician School of Public Administration.

in which they are uninterested and participate very little[3], should be noted.

However, within the specific legitimacy, Andalusians value positively the labour of successive governments and the evolution of major public policies. Since 1996 (first data available from the BOPA of IESA) the percentage of Andalusians who value the labour of their regional government positively is higher than those who value it poorly, however the distance between the two has fallen somewhat. In 1996, 48% appreciated the work of the government versus 31% who valued it badly and in 2009 these figures were 43 and 41% respectively. Between 1997 and 2007 the positive valuation exceeded 50%, even reaching 60%.

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As for public policy, most Andalusians consider that since 1997 the main public policies have been improving continuously or have remained stable. Very few believe they have worsened. The same applies to infrastructure and public works, health care, care for the elderly, environmental protection, universities and R&D programmes or tourism policies. In all these fields the number of Andalusians feeling that the policies have worsened is rather low (between 10 and 20%) and those who think they have improved or remained unchanged exceeds by far 50%. It is, therefore, a public valuation so widely shared, cross-cutting, between the Andalusians, regardless of their differences[4].

The exceptions are the policies related to traditional Andalusian problems such as unemployment, housing or immigration which have been, or are, more circumstantial. In these subjects, policy valuation is clearly negative, more as a reflection of the problematic nature of these issues. The non university education policy has also received more negative than positive valuations. Because of its importance, it deserves further comment.

The proportion of Andalusians who consider that education has worsened has been since 2005 higher than those who think it has improved. Specifically, in 2009, those who took the view it had worsened were 33% versus 26% who believed it had improved and another 26% who thought it had remained unchanged. However, also in 2009, over one third of Andalusia (38%) believed that the education situation was good, one third thought it was regular and one-quarter thought it was bad. More agreement exists in the idea that the education of young people (not the education system) has got rather or much worse in recent years, believed by half of Andalusians. Responsibility for this deterioration, measured on a scale of one to ten is attributed to parents (8.4), the students themselves (7.6),

3. All these data concerning the legitimacy and functioning of democracy are from the Survey on Quality of Democracy in Spain conducted in 2007 by the CSR (and the IESA in the context of a research project. For the overall results at Spanish level see Gomez, B., Palacios, I. Perez Yruela, M. and Vargas Machuca, R. Calidad de la democracia en España. Una auditoría ciudadana (Quality of democracy in Spain. A citizen audit). Barcelona, Ariel. 2010

4. The evolution of the valuation of public policies can be followed through the series of BOPAs IESA from 1996 to 2009. Recently, two researchers at the IESA have published an analysis of the data evolution in POBAs, authors B. Gomez L.Cabeza, Andalucía sin tópicos (Andalusia without topics), Almuzara, 2010. In it can be seen data used in this work.

5. On the evolution of education see BOPA IESA, 2009.

television (7.2), the education administration (6.7) and teachers (5.3). In this case, what is reflected is concern about a problem that the Andalusian society recognizes and Andalusians believe is a responsability[5] that all parties concerned share.

In summary, we are in an established democracy, with specific features within the national context which we are part of. We value positively a large proportion of what politics, in general and public policy, in particular, have contributed to this change. But we recognize that there are issues in which we cannot be so positive.

3. Development, merit and work

The counterpoint to the perception of change in the previous section has a particularly relevant expression in the valuation made by Andalusians on the development level of the Community, in comparison with the rest of Spain. In 1978, one of the first Studies made by the CSR on Andalusia, 40% of Andalusians believed that the economic development of Andalusia was "much lower" than that of Spain. About 24% expressed the view that it was a bit "lower", 19% it was "equal" and only 7% was "higher". Thirty years later, in 20076, this opinion had changed significantly. Those who thought that the development was "much lower" had fallen to 6.5% and those who thought it was a bit "lower" had risen to 43%. Also, the proportion who believed it was "equal" or "higher" had risen, but less, reaching 24.2 and 15.5% respectively. In other words forty percent believed that we were equal or better and a slightly higher proportion and still very wide (43%) that we are still worse. We have closed the gap; our self esteem has improved, but not enough to feel like the rest of Spain. There is still a way to go.

This ambivalent assessment of our level of development is also reflected in the valuation of our ability to overcome the crisis we are in, reflecting confidence in ourselves and our possibilities. Just over half of Andalusians (51.5%) believe that we are worse prepared than the rest of Spain to get out of the crisis and just over one third (36%) feel that we are equally or better prepared. Centre-left citizens are slightly more optimistic than the centre-right. Nevertheless, even in a time of crisis, nearly half of Andalusians (45%) are optimistic about the evolution of the economy in the coming years, against a slightly higher rate of pessimists (50%).

Within the economy and the general situation in the region, unemployment is the greatest problem for the Andalusians. From the time when we have survey data on the major issues of Andalusia (CSR, 1978), unemployment has always been the most important problem, recognized as such by a high number of citizens, always above 60% and generally over 70% and has reached 85% or more during the years of economic crisis. In Spain, this has also been true, but sometimes terrorism was at the top of the list and in other years the weight of unemployment has fallen to 40%. A remarkable distance from the weight that the main problem in Andalusia has, others have been considered second and third, at best, they have been named by approximately 30% of citizens. Among them are drugs, crime and insecurity, lack of industries and, more recently, immigration and housing. Unemployment rates in Andalusia since 1990 have been above 15%, except in the years 2005 to 2007 demonstrating the weight of this problem.

Work has been a scarce commodity in Andalusia for a long time. It was during most of the 20th century and still remains so today. Access to employment has always, therefore, been a strong concern of Andalusia. Although in bygone days patronage and family relationships prevailed, Andalusians believe that today this has changed. In addition, clichés which must be discarded, have always circulated on the value of work for Andalusians,.

According to the following data, the opinion of Andalusians on these matters is a mixture of modernity and tradition. It recognizes the value of merit to access employment, but coupled with social relation-

6. BOPA IESA, 2007.

7. Data from the Economically Active Population Survey.

Table 1. Agreement or disagreement with the following statements (%)

	Agree	Disagree	Don´t know
Social relations are more influential than personal merit for finding employment and progressing in the workplace.	68.9	25.5	5.7
Andalusians do not appreciate effort and hard work enough.	30.2	64.4	5.6
Andalusians can be reluctant to innovation and change.	38.3	53.1	8.6
Andalusians spend too much time organizing pilgrimages, processions and festivals.	45.4	50.7	3.9
When taking the initiative on economic issues we are quite entrepreneurial.	57.7	31.7	10.5
Andalusia is sufficiently prepared to cope with problems and the changing world.	56.8	30.8	12.4

Source: Public Opinion Barometer of Andalusia, Institute for Advanced Social Studies, 2002

Photo:: Antonio Gaga

ships. We reject the clichés on the value of work and effort, but we recognize that we spend too much time on activities not precisely related to it. We see ourselves as innovators and entrepreneurs.

The universalization of primary and secondary education and easy access to the university have brought far-reaching changes to our society..

In the light of previous data there are still some practices and attitudes that do not fit completely with a meritocratic, innovative and modern culture. But it can be seen how these other more modern values have emerged.

Photo:: B. Moreno

4. Citizens and Society

In this section I will explain some changes and opinions of Andalusians on a mosaic of topics that give a clear idea of what Andalusian society is today.

The biggest change, in my opinion, Andalusians have seen is education. The universalization of primary and secondary education and easy access to the university have brought far-reaching changes to our society. Although the effects can already be perceived, they will be even greater over the years with the maturity of generations who have had the best educational opportunities. Meanwhile, in a sense, we will remain a dual society because the education level is very dissimilar between some generations (people over 50 years) and others who have had those opportunities.

The education level attained has been standardized with the Spanish society. Illiteracy has virtually disappeared. In 2009[7] the percentage of illiterate people and people without schooling among the population aged 16 years and over was 4.30% in Andalusia and 2.32% in Spain, a difference that is explained by the rates of illiteracy that still persist in Andalusia in the older cohorts who had few opportunities to access education. The level of education accomplished by the Andalusians has been increasingly mirroring that of Spain. That same year, the ratio of those who had completed primary education was the same in both cases (29%). Andalusia is two points below the Spanish average in second stage secondary education (17.8% Andalusia and 20.07% Spain) and also three points lower in higher education (19.65% Andalusia and 23.38% Spain). In higher education we still have a slight difference with the Spanish average, but the convergence has been more important than the differences that still separate us.

Andalusian culture is slightly behind in comparison with the Spanish with respect to so-called modern values (modern familism, tolerance, permissiveness, secularism, moral autonomy and participation). It also features social polarization on cultural change, as the older Andalusians (around or over 50 years of age) ascribe to traditional values and those under that age believe in modern and posmodern[8] values. This is a divide similar to that experienced in education.

The Andalusians have the same preference scale as the Spanish and many Europeans. We are particularly interested in the family (9.67), friends (8.47), work (8.33), leisure (8.22), voluntary work (5.96), religion (5 16) and politics (3.73)[9]. We differ in our greater interest in religion and voluntary associations than the whole of Spain (4.76 and 5.55 respectively) and the European average (4.89 and 4.63 respectively). And we are less interested in politics than the European average (4.74) which also has a very low weight on the scale of preferences. These data are consistent with others from different sources. Our interest in politics and our willingness to engage in public affairs is low despite our high expectations in them[10].

From an ideological standpoint, the Andalusians have been self-locating themselves several years now between 4.44 and 4.86, the maximum and minimum values contained in the IESA barometers from 1996 to 2009. This is a centre-left position where those who self-located in the centre (5), on a scale of 0 to 10, are continuously increasing. Indeed, the proportion of Andalusians who self located in that position has grown from 24% to 33% from 1996 to 2009[11].

Andalusians are interested in religion and a large majority (83%) are Catholic, although 40% of them never go to church or religious acts. In spite of this fact more than half of Andalusians (68%) disapprove of the church intervening in the political debate,

8. This conclusion is drawn from Bericat, E., " Valores tradicionales, modernos y posmodernos en la sociedad andaluza (" Traditional, modern and post-modern values in Andalusian society") in Moyano, E. and Pérez Yruela, M., ed., (2002) La sociedad andaluza (Andalusian Society), Cordoba, IESA.

9. Sample Andalusian data of the European Social Survey 2003. The importance level in brackets is measured on a scale of 0 to 10. See also BOPA IESA, 2004.

10. On the political culture in Andalusia can be seen Navarro Yáñez, C. and Pérez Yruela, M., Cultura política en Andalucía (Political Culture in Andalusia), Moyano, E. and Pérez Yruela, M., ed., (2002), op. cit. Also, see Andreu, J., ed. (2005), Desde la esquina de Europa. Análisis comparado del capital social en Andalucía, España y Europa. (From the corner of Europe. Comparative analysis of social capital in Andalusia, Spain and Europe). Sevilla, Centro de Estudios Andaluces (Centre for Andalusian Studies).

11. View BOPAs IESA, 1996-2009 and Chapter V of the op. cit. Andalucía sin tópicos (Andalusia without topics). Andalucía sin tópicos

taking the view that the positions of the Episcopal Conference do not represent the opinion of the majority of Catholics (61%) and would like the funding the church by the state to be lower (48%)[12].

Finally, the data we have on the subjective satisfaction of the Andalusians over recent years reflect a society with a high average level of subjective satisfaction with their personal life. On a scale of 0 to 10, satisfaction with personal life was of 7.12 in 1998[13] and 2003 and 7.41 in 2009[14]. For the past year, data from Andalusia and Spain (7.31) are very similar. We are ahead of countries like France (6.35), Germany (6.95) and England (7.08), but below others such as Denmark (8.54), Finland (7.94), Norway (7, 89), Sweden (7.86) and Holland (7.69).

Photo:: B. Moreno

5. In conclusion

Andalusia has changed and modernized over the past two decades, but continues to present contrasts because several different Andalusians are living together at the same time, each with their actors, characters, symbolic expressions and spaces of representation. A modern Andalusia is growing through the remains of old problems that, although they are being left behind have not disappeared completely because their effects are still present. The starting point was difficult. It could be anticipated that it would not be easy to overcome this distance in the twenty years that the Andalusian society has been able to have the necessary protagonism to drive this transformation. In fact, there are still issues pending. This mixture produces a sense of an unfinished process, when in reality it is an ongoing process whose results may be seen in a few years. A new phase is opening in which the important thing will be that the modern and the knowledge society settle down with all their consequences, to address the qualitative changes that are needed in all areas, to improve the quality and rigor of all processes and activities that concern us. ■

12. See POBA IESA, 2007
13. Survey on Quality of life in Andalusia. IESA, 1998. In this survey more detailed information can be obtained on Andalusians subjective satisfaction on different issues.
14. Data for 2003 and 2009 come from the European Social Survey.

Andalusian women lead the new jobs

One of the most interesting aspects of the behaviour of the female workforce in Andalusia over the last 10 years is related to the incorporation of women into the labour market.

In 2001, the profile of women who, being economically inactive or unemployed the previous year, were then employed was described favourably in comparison with men, in the level of educational attainment, but unfavourable with respect to employment. Indeed, 19% of women had higher education and 27% completed their secondary education versus 8 and 21% respectively of men. Women are mainly engaged in the service sector (72%) while men were in agriculture, industry and construction (64%). Despite these better educational credentials, the predominant occupations among women were unqualified in a much higher rate than men (88% vs. 59%).

In 2010 women who have taken up employment1 in the past 12 months have much better educational credentials in higher education than men (31% vs. 18%) and this is reflected in that the declining importance of unskilled occupations is higher among women (falls to 75%) than men (increases to 61%) despite male employment now being more balanced between services and other sectors.

These data lead us to think that the renewal of the Andalusian production model towards more knowledge intensive activities counts on a valuable asset, the human capital of Andalusian women that is not only growing but is projected in new jobs. Hopefully, those expectations will be met. ■

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Profiles of access to employment in Andalusia. Economically Active Population Survey 2nd Quarter (%)	Woman 2001	Man 2001	Woman 2010	Man 2010
Educacional attainment				
Primary Education	54	71	46	61
Secondary Education (Secondary and Vocational Training 1)	27	21	22	21
Higher education (University and Vocational Training 2)	19	8	31	18
Activity				
Services sector	72	36	85	48
Others (Agriculture, Industry, Construction)	28	64	16	52
Qualification				
Non manual highly skilled jobs (directors, professional people and support technicians)	8	10	22	13
Non manual low skilled jobs (Administrative staff, qualified service personnel)	46	13	43	18
Manual highly skilled jobs (Qualified personnel in agriculture, industry and construction)	4	31	3	26
Manual low skilled jobs (Non qualified workers)	42	46	32	43

Source: INE Economically Active Population Survey

1. People with new or renewed contract whose duration is equal to or less than one year

Public services

Education

Percentage distribution of population by highest educational attainment

Population of 16 years and over	1990	2009
Women		
Secondary education	27.7	44.5
Higher education	5.3	19.8
Men		
Secondary education	32.2	49.4
Higher education	6.9	19.6

Education indicators

Teachers and Students Enrolled	1990	2009
Primary and Secondary Education Teachers	66,197	99,438
Primary and Secondary Education Students	1,511,016	1,284,357
University Professors	7,891	17,271
University Students	160,377	222,672
Students/teachers ratio		
Primary and secondary education	22.8	12.9
University	20.3	12.9

Health

Life expectancy at birth for men has increased from 72.5 to 76.9 and for women has risen from 79.5 to 83.0.

The gross infant mortality rate has gone down from 8.9 per 1,000 live births to 3.9.

Average Length of Stay per Hospital Admission in Andalusia has fallen from 8.7 days in 1992 to 6.3 in 2008.

Health Indicators

	1990	2009
Doctors per 1000 population	3,36	3,94
Registered nurses per 1000 population	3,51	4,21
Primary health care centres	165	1.506

Education and education services:

balance and future challenges

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Summarily we will present, first, the unprecedented transformation in education, excluding the university that Andalusia has experienced in the two decades analyzed. Second, the insufficiencies, the existing problems presented in comparison with other communities and, above all, to achieve European objectives. Finally, future challenges in education, development and implementation of the Education Law of Andalusia (ELA) in the context of a knowledge society.

Andalusia in late 1982 was given the responsibilities with respect to Education from the State Administration. A year earlier the Statute of Autonomy was approved. Since then, an effort to modernize has, undoubtedly, allowed society to overcome some historical deficiencies through a sustained growth process, as we shall describe. With the inevitable constraints of family background and socioeconomic status, education in these decades has no longer been a privilege of the wealthy, allowing access to the entire population aged from three to sixteen years.

The 20-year period we analyzed, in education, began with the enactment in 1990 of the Law for the General Organization of the Education System (LOGSE), which regulated the structure and organization of the non-university education system, rising the compulsory school age to 16. The development of this law affected two decades of education development in Andalusia. Also the difficulties arising from its implementation, many of them due to social changes marked its repeal and replacement in 2006 with the Organic Law on Education (LOE). In 1990 the challenge was to provide schooling for the entire population, in 2010, in a knowledge society facing an economic crisis, the challenges for Andalusian education, as stated in the preamble of the LOE, are different:, a higher quality education for all generations, with higher professional qualifications and Higher Secondary Education.

In March 2006 the Regional Government Ministry of Education published the document

Ilustration: B. Moreno

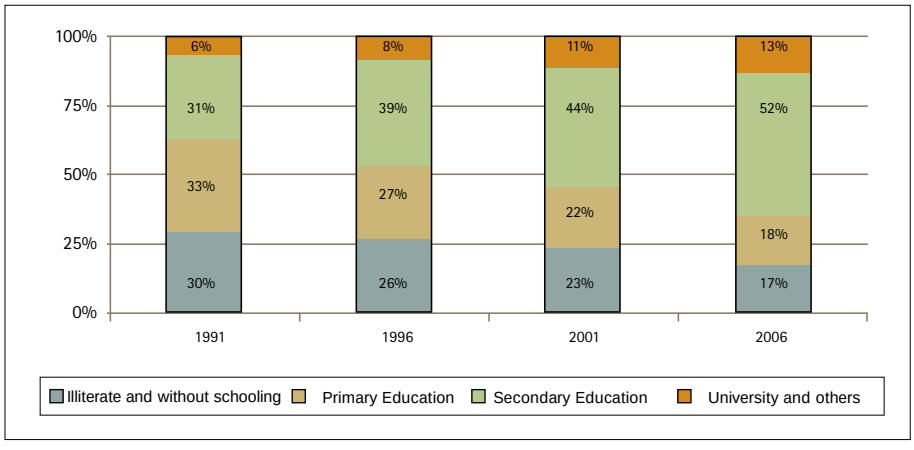
"Education in Andalusia: A shared commitment", a commitment for the future as a basis for the educational community to discuss and take stock of the achievements and shortcomings of the Andalusian education system which will serve, in turn, as the base for the new Education Law of Andalusia (LEA), approved in December 2007, under the new Statute of Autonomy and the LOE. The development of the LEA marks the future horizon. Having achieved schooling for all people up to the age of 16, the targets are now to reach the average level of European Union countries within the European objectives set for the next decade, as reflected in the recently launched "Esfuerza" (Educational Effort of Andalusia), a set of measures to improve the education system.

1. A highly positive first balance

Education in Andalusia in the last 20 years in general has had a spectacular development in both educational services and the educational and cultural level of the Andalusian population, in tune with the social and economic development in Spain over these two decades. Any comparative indicator taken into account (educational offer, pupils by level, teachers, support services and special programmes, scholarships, funding, etc..) illustrate the, in some cases, astounding increase, when dragging major deficits. For example, between 1990 and 2010 the number of schools (from 4,255 to more than 10,000) has more than doubled in the effort to expand Obligatory Secondary Education and the number of teachers has grown by 50% (from 80,000 to 120,000). Only the number of students has decreased due to the declining birth rate only offset by the increase of immigrants. Nevertheless, this has improved student teacher ratio.

At the outset, with an overall look at this educational transformation in Andalusia it should be stressed that achievements include practically total universal compulsory education. What had long been a utopia, as the preamble to the Education Law in Andalusia set out, has been achieved, ensuring at least ten courses of schooling to the entire school population. It has reduced the proportion of population over 16 years with no schooling and those who only have primary education to about half. These lost proportions in the first levels of education, as pointed out by Trinidad and Canton (2008:161-2) mean increases in higher levels (secondary and university). Thus, the population percentage over 16 years coming to secondary education has increased by 70% and those entering the university by 107% (Figure 1). In 2006, 13% of the population

Figure 1. Evolution of the Andalusian population of 16 years or more according to educational attainment (1991-2006)



Source: Institute of Statistics of Andalusia (Trinidad and Canton 2008: 162)

over 16 years had tertiary studies, but the educational attainment in recent years has ensured that 52.1% of the.

Andalusians have completed secondary education level. Similarly, if in 1991-1992, only 13% of 3 year old Andalusian children were enrolled in nursery school in the 2010-2011 academic year, almost all children of this age are enrolled in schools. In parallel, as mentioned, the post-compulsory schooling population (pre-university and training cycles) has increased, even though we are far from achieving European objectives. All this has meant a change in the school network, an increase in the number of teachers and increased educational infrastructure and services.

Table 1. Schools and students in two decades (1990-2010)

	Infant Education	Primary Education		Secondary Education	
	Students	State centres	Students	State centres	Students
1990/1991	188,591	2,257	997,643	584	431,574
2000/2001	210,357	1,961	556,645	876	665,869
2010/2011	374,166	1,993	547,006	2,209	582,783

Source: Institute of Statistics of Andalusia. Regional Government Ministry of Education

Table 1 makes a significant comparison between decades in reference to the number of students and state schools, where growth is observed in recent years. The high number of pupils in Primary School (then called GBE-General Basic Education) in 1990 is explained firstly by the high birth rate and, especially, because it includes all students up to age 14.

Moreover, the development of new Vocational Training, derived from the LOGSE, with the Intermediate Cycle and mainly due to its novelty, Higher Cycle, has enabled this education to be integrated into the labour and productive market, but, in parallel, has demanded a substantial increase of teachers and schools network. Higher cycle demand, increased in the last few years because of the economic crisis, has resulted in most of the places offered being filled in June. However, despite having significantly enhanced their attractiveness and social status in recent decades, there is still a preference for high school (three-quarters of students) over the intermediate training cycles (a quarter). In relation to European Union countries, while the percentage of graduates in general programmes (BA) is quite acceptable, the graduation rate for intermediate vocational training in Spain is 39%, a far cry from the 51% of the European average and 45% of the OECD average.

Also, it is important to emphasise the impressive progress of women in Andalusian education, in parallel to the situation in Spain, both in their access to different educational levels, particularly the university, catching up with or exceeding male rates, as in the teaching profession. Moreover, as is well known (Fernández Enguita et al., 2010), girls are more successful in the education system, both in access and in outperforming boys.

2. Additional educational and support services

These decades have led to a gradual assumption of government responsibility for social services, some of them free, to compensate disadvantaged students and, in particular, contribute to equality for women, making it possible to reconcile work and family life such as the new services in scholar centres (canteen, early morning room and extracurricular activities) and school transport. Also schools residences whose students in the academic year 2010/11 rose to 6694 (with Boarding Schools and other entities).

As shown in Table 2, the service with the highest increase in recent years has been the extension of opening hours of the centres (usually 7.30 am to 20.00), the most recently created and has tripled in five years. The tendency is to grow, either as early morning or as late rooms offering other activities in the afternoon or the canteen service. The transport service is subject

Table 2. Evolution of the number of schools and educational services

School year	Education services		
	Canteen	Transport	Extension of school opening hours
1999-2000	878	1,064	---
2004-2005	1,190	1,044	691
2009-2010	1,448	1,562	1,993
2010-2011	1,524	1,529	2,080

Source: Ministry of Education and Science, Regional Government Ministry of Education and School Council of Andalusia. By authors

to ups and downs, but with a clear downward trend in the number of routes, because schools are increasingly nearer the student´s place of residence. However, in recent years, the service, previously limited to compulsory education, has been extended to primary and secondary education explaining why it has not fallen more. Moreover canteen facilities have almost doubled in a decade, integrated in the Extended Opening Hours Plan for scholar centres. Each year a uniform price is set in all school canteens and subsidies of from 10% to 50% depending on family income are also set, while free meals are guaranteed to all students with split morning and afternoon schedules who must commute and have no school bus at midday and for those who are in extreme social difficulty and at risk of exclusion.

To reduce early school leaving rates (38%, the highest in Spain) and lower the differential with the rate established by the European Union (10%), "Scholarship 6000" was launched during the 2009-10 school year, so as to facilitate permanency in education of high school or intermediate vocational training course students (3,697 students in 2009-10 and 9,500 during 2010-11). Free textbooks for all pupils in Primary and Secondary Education, in both state and state-subsidized centres is another service implemented. The measure has become more widespread since the 2008-09 academic year. In 2010-11 over 940,000 students will benefit. In parallel, since the 2009-10 a personal computer has been given free of charge to all students of 5th and 6th course of Primary Education (173,595 students) as well as a digital blackboard in the classroom.

To the above mentioned programmes we should add, during the 2004 – 2005 school year on an experimental basis, the Plan for Reinforcement, Guidance and Support (PROA) was launched, promoted by the Ministry of Education and Science and 50% co-financed by the autonomous communities. The Plan aims to ensure attention to groups with a higher risk of social exclusion, materializing in School Assistance Programmes in Primary and Secondary Education and the Support and Reinforcement Programme for Secondary Education. Growth has been the trend of these experimental programmes. The budget of these improvement programmes for academic success has been increasing as has the number of participating centres.

3. Problems and Future Challenges

Two problems or deficiencies can be detected in Andalusian education, with higher figures than communities in the north of Spain.

[1] To have ended the decade a long way from reaching the European education commitments of 2010 ("Education and Training 2010"), known as the Lisbon Strategy remains a serious problem. This set the early leaving rate to below 10%, while achieving 85% of youth (22 years) having completed Upper Secondary Education. In this regard, to reduce the level of early leaving and failure rates is a prime target, which has averaged 38%, increasing the number of young people, who once they successfully complete Compulsory Secondary Education, continue and complete Bachillerato (Pre-University) or Intermediate level Vocational Training.

The strategy Europe 2020 passed under the Spanish Presidency (June 2010) of the European Union, called for the advisability of reducing the early leaving rate to

10% or less and increase to, at least, 40% or the percentage of population (between 30 and 34 years) who completed Higher Education or equivalent. Paradoxes of the Spanish situation and especially Andalusia is that while we are still very far from the first goal, however, in terms of Higher Education we have reached the percentage that Europe has set. This is what has been called "inverted school pyramid." To meet European objectives -a question of State, a priority objective of any possible political "pact" – means to work, on the one hand, to curb the exodus from Institutes of Secondary Education of thousands of young people, after Obligatory Secondary Education and on the other, "repechage" those many who abandoned their training. For both circumstances the possibility of doing Bachillerato must be enhanced, making it more flexible (as is now permitted by the rules) and, above all, promoting Intermediate Vocational Training, where in number of graduates we are situated 10 points behind the EU average.

[2] In late-modern societies, the goal of compulsory universal education has had its downside: more than one third of students fail Secondary Education graduation. As schooling rates increase, other types of inequality, according to the statistics, non integration, exclusion or marginalization of a group are generated. Moreover, this problem far from being of short term nature in a particular year, after its persistence over the last decade, it seems to be ingrained and furthermore rising. The worst of the school failure rate therefore is that, rather than gradually reducing over the past five years it has maintained an upward trend that has been unstoppable (Fernández Enguita et al., 2010). If at the end of the 1999/2000 academic year 26.7 percent did not complete the ESO in Andalusia in the 2005/2006 academic year the percentage rose to 34 percent.

Among the challenges that the LEA is proposing, in agreement with the motto of European policies and other regional laws (Cantabria, Catalonia, Castilla-La Mancha) is to achieve "academic success for all" or, as the " Esfuerza " initiative states, "universal school academic success," ensuring that everyone achieves a set of essential skills. This latest initiative gathers 80 measures to improve the education system and tackle the new challenges of today's society.

If these two decades have led to settling the centennial arrears that Andalusia has historically suffered, in a globalized era, the PISA (Programme for International Student Assessment) reports remind us every three years how far from the best countries we still are, below average. To achieve a quality education system that equitably benefits the most disadvantaged is a major challenge. The new strategic framework for European cooperation in the fields of education and training ("Education & Training 2020"), establishes among the strategic objectives for the decade 2010 to 2020, "to improve the quality and effectiveness of education and training" and "promote equity, social cohesion and active citizenship ' These are also challenges for Andalusia. The LEA must provide an instrument for achieving them. ■

Joining forces to multiply results

In the last twenty years, Andalusia has experienced substantial growth in all performance indicators that measure the evolution of training, research and innovation processes. From the 160,377 students enrolled in college in 1990, we reached 222,672 in 2009. This evolutionary and transformation process of our Autonomous Community has also resulted in from the 2,198 companies that had innovative activities in 2000 we have gone to 4,850 in 2008. And the 4,177 euros gross disposable income per capita in 1990, reached 11,889 euros in 2007.

These and other figures offer a macroscopic vision of the evolution process experienced by this region in the last twenty years, which leads us to state conclusively that there has been a substantial change in all areas of activity of our society, reducing the primary sector and multiplying exponentially the so called service sector, making it a more modern community and above all more efficient. However, for a university student with leadership responsibilities and, above all, a researcher who works at the University and believes that the main objective of this academic institution is to use knowledge for the benefit of society, either contributing to change the economic and production model, as called for now, or to raise the level of training, expertise and knowledge of our students, as will always be required, this process of transformation is not enough.

Compliance leaves us indifferent, contradiction makes us productive and effective, said Goethe.

In the commitment for productive efficiency, the Universities of Malaga and Seville, have decided to join forces to multiply results in agent aggregation processes to create a campus of international excellence "Andalusia Tech," which has been recognized by the Ministry of Education. This campus seeks to be a model in the process of change: a global university, a unique international campus to attract talent and an opportunity to overcome the crisis by changing the production model of our country, to support it in the bases of knowledge and transfer of research results to companies with the aim of promoting innovation.

The university, like culture, is an ornament in prosperity and a refuge in adversity, but will always be the engine for economic and social model change and, above all, the agent that brings greater enhanced knowledge.

The mission of our campus project of international excellence is to attract, integrate and develop talents creating an ecosystem for generating knowledge and innovation, committed to society that will raise the level of excellence in teaching and research activities, using an open, universal, sustainable scientific-technological campus model.

We are contemplating a university closely linked to the productive environment and their companies and entrepreneurial activities.

In a world where the economy is global, there is freedom of movement for workers and capital, the decentralization of companies and the globalization of culture and knowledge has happened, universities have to come together to be, in addition to sources of knowledge, elements of cohesion and structuring of society, opinion leaders and, above all, key players in the systems of training and employment, research-transfer and economic and social development.

Join forces to multiply results. In Andalusia we need more joint projects. Let us use knowledge for the society benefit.■

Adelaida de la Calle Martín
Chancellor of the University of Malaga

Some data on universities

20 years ago in Andalusia the university offered 117 academic titles out of which 5 were higher technical education, 18 technical education, 29 diploma courses and 65 degrees. At present, the 10 Andalusian universities offer 984 official academic titles of which 405 are bachelor and 579 official masters. The first decade saw the expansion and consolidation of the Andalusian university system with the creation of the Universities of Almeria, Huelva, Jaen (1993), the International University de Andalusia (1994) and Pablo de Olavide (1997), along with the increase and diversification of supply in the Universities of Cadiz, Cordoba, Granada, Malaga and Seville. In this period the number of university students increased from 160,337 during 1989/90 to 273,106 in the 1999/2000 academic year.

During the second decade, the Andalusian universities have carried out the profound transformation required to build the European Higher Education Area (EHEA) initiated with the Bologna Declaration of 1999, which leads to:

- *The adoption of an easily understandable and comparable degree system.*
- *The adoption of a system based on three cycles (bachelor, master and Doctor)*
- *The use of ECTS (European Credit Transfer System) to measure student achievement.*
- *The promotion of students, teachers and administrative staff mobility and services.*

This enormous process of expansion and transformation has been made possible by the main resource of any university, that is, the staff along with the growth of all budget items.

Since 1990 when the Andalusian universities had 7,891 teachers, the teaching staff, support teachers and research staff have grown to reach in 2008/09 a total of 26,244 professionals, with the distribution shown in the following table:

	Women	Men	Total
Teaching staff	6,001	11,270	17,271
Administrative and services personnel	4,974	3,999	8,973
Total	10,975	15,269	26,244

At current prices, budget expenses statement has grown from less than 315 million euros in 1990 to exceed 1,775 million in 2008, with the following evolution of the distribution by chapters:

Expenditure	1990 (%)	2008 (%)
Personnel	68.48	57.13
Operating	14.26	12.47
Investments	16.48	23.70
Rest	0.80	6.70
Total	100.00	100.00

CWith these resources, the number of people who obtained a university degree rose in 2008 to 33,420, of which 20,774 (62.2%) were women. ■

José Luis Pino Mejías
Former Director General of Universities and Research of the Junta of Andalusia

Photo:: Antonio Gaga

Population health and health services in Andalusia (1990-2010)

Felicidad Rodríguez Sánchez
Dean of the Faculty of Medicine
University of Cadiz

Over the past 20 years there have been numerous changes in the Andalusian population and their health status. A population in 1990 of 7,100,060 inhabitants and currently, according to advance data for 2010, 8,353,843. A population in which the average age has risen from 34.29 in 1990 to the 39.04 today and which the elderly occupy an increasingly important sector, so if in the early 90's, people over 65 accounted for 11.72% of the Andalusian population, now they constitute 14.97%.

1. Improving health

Throughout this period, the health of our population has improved considerably. In 1990 life expectancy at birth for men was 72.5 years in Andalusia and the latest available data from 2008, indicates that life expectancy is 76.9 while women have increased from 79.5 to 82.9 years. As shown in the Demographic Information System of Andalusia, while the gross death rate has seen little change, the gross infant mortality rate has gone down from 8.93 ‰ in 1990 to 3.93 in 2009. This evolution is no stranger to the improvement in the quality of life and health care. Morbimortality due to specific diseases has dropped dramatically, while other different disorders have gained importance. Logically, the increase in life expectancy, linked to the improvement of the quality of life and health status of the population, has given rise to a pathology inherent in the elderly, while there is also increasing interest in knowing the causes of rare diseases and how to cope with them, a decisive step in progressing towards identifying the cases, as can be derived from data contained in the Genetics Plan of Andalusia. Moreover, the inclusion of various infectious diseases in the immunization schedule has resulted in a virtual elimination of many of them. Emerging infectious agents closely linked to the current process of globalization deserve a special mention. On the other hand, the evolution of reported cases of notifiable diseases, according to the Statistical Yearbook of Andalusia and the Regional Government Ministry of Health, offers an image on the status of each disease. For example: Brucellosis (1990: 820, 2009:56), Mumps (1990: 9025, 2009:

76), Pertussis (1990: 4,153; 2009: 44), while the prevalence of hepatitis in recent years has been: Hepatitis A (2001: 143, 2009: 758), Hepatitis B (2001: 133, 2009: 134), Hepatitis C (2001: 235, 2009: 207). For tuberculosis the cases notified in 1990 were 901, in 2009 1,118. A rise in reported tuberculosis cases reaching an incidence of about 35 cases per 100,000 population was initially observed. After starting the Tuberculosis Control Programme, the incidence rate decreased to about 17 cases per 100,000 population, with a decrease of HIV- related hepatitis, although an increase was observed in areas of immigration. In regard to AIDS, when in 1990 the rate per million population was 69.39, the incidence in 2010 is 14.45, with an increase between 1993-1997, during which it peaked at 164.05.

Table 1. Deaths by main diseases of the International Classification of Diseases (ICD-10) (2008).

	Almeria	Cadiz	Cordoba	Granada	Huelva	Jaen	Malaga	Sevilla	Andalusia
Certain infectious and parasitic diseases	95	202	126	149	83	93	229	270	1,247
Neoplasms	1,132	2,386	1,738	1,785	1,097	1,415	3,000	3,842	16,395
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	24	21	17	16	15	22	20	33	168
Endocrine, nutritional and metabolic diseases	126	267	265	250	119	245	281	483	2,036
Mental and behavioural disorders	130	232	238	169	58	156	272	369	1,624
Diseases of the nervous system	213	390	290	307	164	253	481	591	2,689
Diseases of the circulatory system	1,369	2,865	2,396	2,546	1,622	2,028	4,319	5,708	22,853
Diseases of the respiratory system	574	914	849	826	411	737	1,211	1,440	6,962
Diseases of the digestive system	234	557	454	450	242	437	681	802	3,857
Diseases of the skin and subcutaneous tissue	11	50	25	21	19	13	23	54	216
Diseases of the musculoskeletal system and connective tissue	46	77	59	63	36	73	69	110	533
Diseases of the genitourinary system	118	237	191	228	124	197	280	355	1,730
Pregnancy, childbirth and the puerperium	-	2	1	1	1	-	4	1	10
Certain conditions originating in the perinatal period	23	37	20	31	8	16	37	54	226
Congenital malformations, deformations and chromosomal abnormalities	15	33	21	28	12	26	40	55	230
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	241	283	247	396	150	254	333	206	2,110
External causes of morbidity and mortality	257	356	274	329	143	225	531	539	2,654

Source: Institute of Statistics of Andalusia, Regional Government Ministry of Health. Vital Statistics Unit.

2. Changes in the organization

When, in 1984, medical competences were transferred, the organization of health management was very different from what we know today. Most services were managed by the National Health Institute (INSALUD) and benefits managed by municipalities and county councils coexisted with the Compulsory Health Insurance and various mutual benefit societies. In 1986 the Andalusian Health Service was created, a structure that should cover all these elements, integrating INSALUD centres, the 8 general hospitals dependent on councils, the competences in Mental Health with the old psychiatric hospitals, several municipal hospitals and Several Red Cross hospitals. Currently, the Autonomous Community directly manages all public health resources and services, with the exception of those assigned to the Ministry of Justice and the Ministry of Defence, keeping partnership agreements with them and with various private health

services. The main instrument of health policy is the Andalusian Health Plan, the existing Third Plan 2003-08. Its precursor was established in 1994. During this period the Comprehensive Mental Health Plan I and II of Andalusia (2003-07 and 2008-12), the Quality Plans of the Public Health System I and II (2000-04 and 2005-08) have also been developed .The Regional Government Ministry of Health is the regional body that manages, directly or indirectly, the largest budget volume of the Autonomous Administration. During these years agencies, although under the Regional Government Ministry, administering health services with a high level of autonomy, have also been created. The first is the Andalusian Health Service (SAS) whose portfolio covers Primary Care, Specialist Care, the Mental Health Network, the Transplant Coordination Network in Andalusia and the Blood Transfusion Centres, among other services. The SAS presented in 1997 its Strategic Plan, which articulates the new model of Clinical Management Units, the accreditation of expertise and professional career development, among others.

Illustration: B. Moreno

The SAS is adding other agencies under the Public Health System: the Public Company for Health Emergency, the Hospital Costa del Sol, the Hospital de Poniente, the Hospital Alto Guadalquivir and the Public Health Company of the Bajo Guadalquivir. To these are added other subsidiaries that perform specialized functions different from the direct provision of health services: the Andalusian Foundation for Social Integration of the Mentally Ill, the Andalusian School of Public Health, AVANTE Foundation, Progreso y Salud Foundation (Health and Progress), Agencia de Calidad Sanitaria de Andalucía Foundation (the Health Quality Agency of Andalusia) and the Agency for Health Technology Assessment of Andalusia.

3. The improvement in health services and resources

But if during the last 20 years, the management structure of public health has changed substantially, the changes in health services and resources have not been less. An example is the implementation of the Integrated Management and Information System for health care to integrate all user information in a single digital medical history, regardless of the professional or health care setting that generates it.

With regard to Primary Care, Health Centre network has been developed, drawing the health care map of Andalusia, grouping the basic health areas into Primary Health Care Districts. When the Andalusian Health Law was approved, in 1998, the number of Centres was of 1,006, with 14,711 Primary Care personnel to serve a population of 7,236,459 inhabitants, in 2009 there were 1506 Primary Health Centres for a population of 8,302,923, with 20,694 professionals, according to the latest data available for 2008. The extension of the Primary Care Network and the greater availability of resources have also increased its portfolio of leading services. Data Information System for Primary Care Management enables the monitoring of the progression in the number of consultations performed in its centres. In General Medicine, the average daily consultations per professional decreased from 51.92

in 1993 to 43.53 in 2009, nursing consultations have gone from 28.13 to 24.76.

By contrast, the cases handled in Paediatrics increased from 25.54 to 29.51 and Social Work from 5.03 to 6.16.

The transformation of services is also seen in Specialist Care, where the number of Public System Centres has increased from 64 in 1998 to 81 in 2009, while the number of professionals in 1998 was 57,364 and rose to 67,848 in 2008. The hospital care network has been progressively growing and in 2009 has 83 hospitals, of which 45 are public. In that year, there were 22,209 beds in Andalusian hospitals, while the latest data available (2008) on the number of beds in operation in the public and private hospitals, indicate 14,719 and 4,787, respectively, with a slight increase in beds in private hospitals from 1995 (4,319) to 2008 (4,787). It is essential to correlate all that data with average admissions and stays, to assess their adequacy and the efficiency of strategies and forecasts. For the Public Health System, in 2008, the number of admissions was 673,455 and stays 4,259,570.

Table 2. Andalusian public health system centres, 2009 (data to December 31st).

	Almeria	Cadiz	Cordoba	Granada	Huelva	Jaen	Malaga	Sevilla	Andalusia
PRIMARY CARE	229	127	140	328	124	196	179	183	1,506
- Health care centres	34	53	39	50	29	40	63	82	390
- Local surgeries	100	49	71	162	66	87	75	89	699
- Auxiliary surgeries	95	25	30	116	29	69	41	12	417
SPECIALIST CARE	5	14	8	10	4	11	10	19	81
- Specialist external outpatient clinics	1	9	2	5	1	5	3	10	36
- Hospitals	2	5	3	4	3	3	5	4	29
- High Resolution Hospitals C.H.A.R.E	1		2	1		2	1	4	11
- Other Hospitals (Hospitals run by Public Companies and other forms of management)	1		1			1	1	1	5

Source: Andalusian Health Service and Regional Government Ministry of Health Companies.

Table 3. Evolution of the number of public health care system centres of Andalusia.

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Primary care	1,006	1,016	1,424	1,451	1,460	1,461	1,475	1,475	1,491	1,497	1,502	1,506
Specialist care	64	71	66	64	66	65	67	71	71	80	74	81

SOURCE: Andalusian Health Service

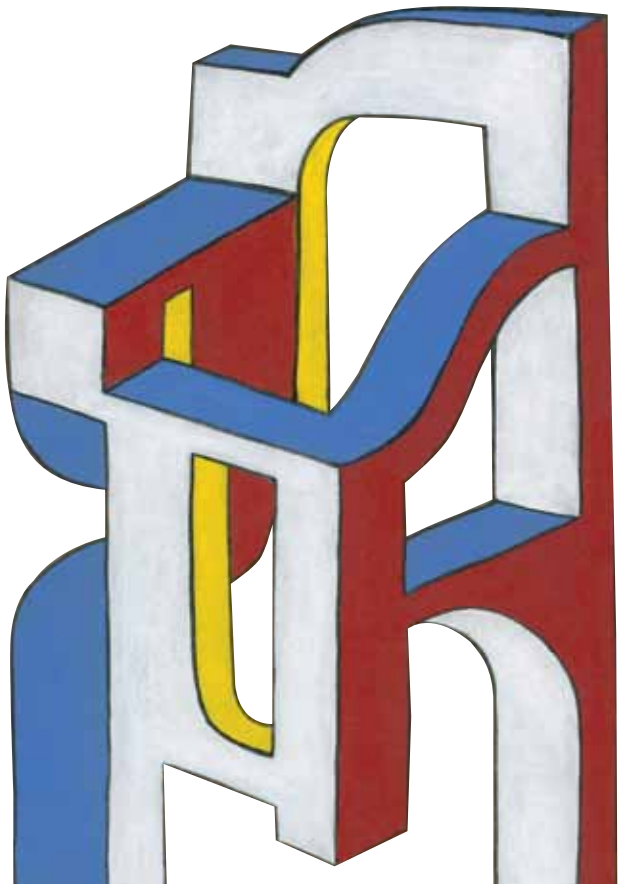
One service that has undergone a major transformation in the last 20 years has been Mental Health. Following the dismantling of psychiatric hospitals, a new model consisting of a network of centres including community mental health units (77 today) child and adolescent mental health (14), rehabilitation units (9), day hospitals (14), inpatient units (19) and therapeutic communities (14) was structured.

On the other hand, there have been also many services that, over these 20 years, have been developed in the inpatient and outpatient areas (Dialysis Centres, Sexually Transmitted Infections Centres, etc.).. In 1991 the Coordination of Transplants for the Autonomous Community was created and if in 1996 there were 375 solid organ transplants, in 2009 there were 667 in 2009. The Blood Transfusion Centres network of the SAS was created and its Regional Centres make up, since 1997, Sectoral Tissue Banks. Action plans have been developed such as the Andalusian Accident and Emergency Plan, which dates back to the early 90s, Integral Oncology

Plan I and II, Palliative Care Plan, the Comprehensive Diabetes Plan I and II, the Comprehensive Heart Care Plan, the Comprehensive Childhood Obesity Plan, the Care Plan for people with rare diseases, the Andalusian Care Plan for pain, the Andalusian Environmental Health Plan, among others. Various action programmes have also been developed, such as Dental Care for children, the actions on Epidemiological Surveillance and Food Security, or initiatives based on new technologies, such as advances in telemedicine. Several strategic plans have also been developed; mention should be made of the Research, Development and Innovation Plan, to strengthen biomedical research, within its framework research centres have been created, some, in partnership with other institutions.

Human resources play a key role in health care. The registered physicians in 1994 were 25,907, reaching 32,740 in 2009, while in 1994 there were 27,854 registered nurses and 34,947 in 2009, decreasing from the previous year, 2008 (35,120), although it should be noted that registration is not required to work in the public health system. According to recent Organization of Registered Doctors data, the number of registered doctors in Andalusia was 3.63 per 1000 population in 2007, somewhat below the national average (3.8), although both above the EU average (3) indicated by the OECD for the same period. Another issue, common to the whole of the Spanish territory, refers to the prominent changes observed in the distribution of these human resources, with respect to specialties and rural or urban provincial distribution. The concision of this article prevents expansion on this aspect, which must be treated in depth, taking into account age structure studies, in order to make the necessary previsions.

We can assert that, as a whole and for the past 20 years, the Community of Andalusia has experienced a quantum leap in its health services and our population health improvement has been parallel to that development, even when we are all aware that in health there are and always will be, major challenges we will all continue to face over the next 20 years. ■



Statistical Annex

Andalusia	1990		2000		2009	
GDP at market prices (millions of current euros)	41,132.5		86,216.0		146,622.1	
GDP at market prices (chained volume index)	73.5		100.0		125.9	
GDP per capita (euros)	5,793		11,538		17,485	
Development by sector (percentage)	GVA	Employmen	GVA	Employmen	GVA	Employmen
Agriculture	8.5	15.4	7.8	11.0	4.6	7.4
Industry and Energy	23.1	15.4	13.8	12.6	10.4	9.4
Construction	11.4	12.3	9.2	12.2	11.4	9.8
Services	57.0	56.9	69.2	64.2	73.6	73.4
Exports to foreign countries (millions of euros)	3,388		10,208		14,334	
Foreign imports (millions of euros)	3,921		12,130		18,009	
Labour market: population aged 16 to 64 years						
Total employed people (thousands)	1,874.4		2,273.7		2,904.1	
Total activity rate	57.4		62.2		70.4	
Total employment rate	42.6		47.1		52.5	
Total unemployment rate	25.7		24.2		25.4	
Labour market: population 16 to 64 years. Data by gender	Men	Women	Men	Women	Men	Women
Thousands of employed people	1.364.2	510.2	1,525.6	748.1	1,700.3	1,203.8
Activity rate	78.2	36.6	76.8	47.4	80.1	60.4
Employment rate	62.1	23.2	63.1	31.1	60.8	44.0
Unemployment rate	20.5	36.7	17.9	34.5	24.1	27.2
Number of people covered by Social Security (thousands)	1,972.3		2,379.5		2,906.1	
Foreign born people employed (percent)	0.2		2.2		10.3	
Number of companies in Andalusia	nd		344,420		508,285	
Total trading companies created in the year	7,225		17,076		12,843	
Number of tourists (millions)	nd		18,5		22,1	
Overnight stays in hotel accommodation (millions)	17.1		34.5		40.6	
Resources for R&D to GDP (percent)	0.46		0.65		1.10	
Expenditure on R&D in total (percentage)	33.41		33.05		31.90	
Expenditure on R&D in higher education as a percentage of the total	41.61		47.94		43.32	
Expenditure on R&D in the public administration as a percentage of the total	24.98		19.01		24.78	
Companies involved in innovation activities	nd		2,198		3,307	
Population structure by areas of Spatial Plan of Andalusia (***)						
Regional centres (percent)	54.9		55.4		55.2	
Rural centres (percent)	6.4		5.7		5.0	
Interior medium sized towns (percent)	26.8		25.5		24.2	
Medium sized coastal towns (percent)	11.9		13.4		15.6	
Population density (inhabitants per sq km) (*)	81.05		83.79		95.37	
Vehicle fleet (millions)	2.3		3.7		5.3	
Motorway, highway and dual carriageway (km)	689		1,911		2,609	
Sea transport of goods (million tonnes)	55.9		83.3		97.9	
Air passenger traffic (millions)	7.4		13.5		18.6	
Protected natural areas (sq km)	14,811		15,847		17,011	
Final energy consumption (thousand tonnes equivalent oil) (**)	nd		11,631		15,214	

Andalusia	1990		2000		2009	
Treatment of municipal solid waste (**)						
Compost (percent)	29.5		55.6		56.9	
Landfill (percent)	27.5		39.8		35.0	
Uncontrolled dumping (percent)	42.6		4.6		1.3	
Recycling (percent)	0.0		0.0		6.8	
Incineration (percent)	0.4		0.0		0.0	
Total Population (*)	7,100,060		7,340,052		8,353,843	
Male Population (*)	3,501,308		3,609,412		4,137,125	
Female Population (*)	3,598,752		3,730,640		4,216,718	
Population under 15 (percent) (*)(****)	22.8		17.7		16.2	
Population over 64 (percent) (*)(****)	11.7		14.3		15.0	
Average age of population (*)	34.2		37.3		39.0	
Foreign born population (*) (****)	61,985		128,916		698,375	
Foreign born population as percentage of the total (*) (****)	0.89		1.76		8.36	
Average number of children per woman	1.7		1.4		1.5	
Number of births per 1000 population	12.9		11.1		11.5	
Average age at first child (female)	26.1		28.1		29.0	
Births out of wedlock	8.33		16.24		31.49	
Life expectancy (**)	Men	Women	Men	Women	Men	Women
at birth	72.5	79.5	74.9	81.4	76.9	82.9
to 65 years	14.6	18.3	15.7	19.3	16.9	20.6
Average age at first marriage	27.0	24.9	29.3	27.4	31.2	29.3
Ageing index (number of persons 65 years old and over per hundred persons under age15)	49.74		80.88		89.58	
Primary and secondary students	1,511,016		1,312,536		1,284,357	
University students	160,377		271,919		222,672	
Infant Teachers	6,868		8,910		14,643	
Primary and secondary teachers	66,197		82,920		99,438	
University professors	7,891		16,586		17,271	
Gross infant mortality rate (‰)	8.9		5.0		3.9	
Percentage of persons over 74 years old living alone	15.64		22.34		23.32	
Registered physicians	23,883		28,857		32,740	
Registered nurses	24,916		32,178		34,947	
Primary health care centres	165		1,424		1,506	
Specialist health care centres	50		66		81	
Stays in hospitals in the Andalusian Public Health System (**)	4,712,902		4.375.182		4.259.570	
Average stay per hospital admission (**)(****)	8.7		7.0		6.3	

(*) Latest data for the advance of 2010 that were available at the time of elaboration of the journal. On December 23nd final data have been published: total population in Andalusia 8,370,955 people (male: 4,144,856; female: 4,226,119). (**) Latest data for 2008. (***) The first data corresponds to 1991 and the second to 2001. (****) The first data are for 1991 except for the average stay per hospital admission that are to 1992. nd: no data

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Her research has focused mainly on studying different aspects of the workings of the economy, especially in Andalusia. In addition to her teaching and research work she has been a specialist consultant in the Economic and Social Council of Spain and research projects director of the Regional Development Institute, University of Seville.

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With regard to Andalusia, numerous studies on the labour market and his extensive collaboration with the Institute of Statistics of Andalusia stand out. He has been a member of numerous experts committees. He collaborated also over the years, with various government agencies such as the Spanish National Statistics Institute, the National Employment Institute or the Ministry of Labour.

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