

TERRITORIAL COHESION MEASUREMENT AT THE REGIONAL SCALE. A METHODOLOGICAL PROPOSAL AND APPLICATION IN ANDALUSIA

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I. INTRODUCTION

Territorial cohesion is one of the political objectives that are clearly shared by the Member States of the European Union. This has led to a great advancement in its definition on the basis of several initiatives such as the consultation carried out through the publication of the Green Paper on Territorial Cohesion (CE, 2008; CRPM, 2008). However, it is still considered an ambiguous and polysemic concept that still needs to be precisely defined in its components for it to become operational for the purposes of public policies. From this perspective, in this article an approach for the analysis of the territorial cohesion concept - and its measurement at the regional scale - is proposed, based on the experience of the Territorial Development Reports of Andalusia.

The analysis of the territorial cohesion at the regional scale faces the same problems as any other scale - among them, the definition of the term - but also encounters two difficulties that are specific to this geographical scale. The first difficulty refers to the need to define territorial units as a starting point to analyse territorial cohesion, as was done in the European Union for countries or regions (NUTS2 units) or at a national scale, in which regions are also the basic units. The second difficulty is the lack of sufficient and adequate information about development and territorial cohesion at each particular scale. All this justifies the need to draft methodological proposals to tackle these problems.

Based on these premises, the goal of this article is making a methodological proposal to assess the degree of territorial cohesion at the regional scale, as well as illustrating it with its application in Andalusia.

II. OPERATIONALIZING THE NOTION OF TERRITORIAL COHESION

For the purposes of this paper by territorial cohesion we mean a set of factors that attract the components of a territory to keep them united and balanced, neutralizing the possible effect of centrifuge forces that could divide them. Based on this definition, it was assumed that the indicators for its measurements should reflect the three following basic components (Collado, 2009): (1) equal opportunities and equity, that make up an essentially economic element; (2) the sense of belonging to the same community or identification in a common project, which has a mainly political dimension; (3) the interrelations between the different territories, in an institutional and socio-cultural context.

(1) **Equal opportunities and /or equity** are the fundamental glue for territorial cohesion. They involve the physical articulation of the territory and, at the same time, territorial justice. They are usually measured according to three essential components: a) infrastructure and transport, that ensure connectivity and allow for the physical territorial articulation; b) accessibility of services and facilities, that guarantee equal opportunities and, as a result, territorial justice; c) a balanced and harmonious territorial development without excessive inequalities and disparities, that would hinder cohesion.

(2) The **identification with a common project** is also an element of uttermost importance for territorial cohesion and it is usually assessed based on the citizen's sense of belonging to a community. In order to understand the degree of territorial cohesion in those territories that are still under construction - as the European Union may be defined - and in those where the current territorial model of the State is being questioned, such as in Spain, it is essential to monitor the degree of citizen identification with a common project through indicators. In other territories that do not meet any of the two previous criteria, such as Andalusia, this component is irrelevant.

(3) The **interrelationship between different territories** is the third component that defines territorial cohesion, which is all the more intense the more numerous relations between different territorial units. These relations can be personal or institutional and especially important are those that serve as an inter-territorial solidarity mechanism due to their marked cohesive power; the EU regional cohesion funds could play this role. No equivalent mechanism exists within the Spanish regions and hardly any detailed studies exist about the interrelations within regions, all of which makes the inclusion of this component in our analysis very difficult. A first interesting attempt to fill in this gap are the works on territorial cooperation in Andalusia by Feria *et al.* (2005, 2007) and Feria (2011).

Based on these premises, in this paper, priority was given to indicators of equal opportunities and equity that are also the best indicators of territorial cohesion as a whole. In fact, territorial cohesion as a political objective of the European Union, aims to pursue more harmonious, balanced and efficient development, as well as achieving the economic convergence of different territories.

III. METHODOLOGY

The analysis of territorial cohesion in Andalusia will focus on two basic components that describe equal opportunities for citizens and businesses, access to transport and hospi-

tal care. To these two, a third component was added that refers to the degree of territorial balance: the disparities in the development level between different territories.

As regards access to hospital care and transport, mean values were used as calculated at the sub-regional scale in the Third Report on Territorial Development of Andalusia, IDTA (Díaz, García and Zoido, 2011). The development disparities were analysed based on the indicators for territorial development derived from the same Report (Pita and Pedregal, 2011b). These indicators are aggregate sub-regional indices that measure the achievement of the territorial development goals with respect to the three main environmental, economic and social components. A total of 8 aggregate indices were defined, of which 3 refer to the environmental component, 2 to the economic component and 3 to the social component (see Table 1).

Table 1
INDICATORS USED TO MEASURE THE TERRITORIAL DEVELOPMENT OF ANDALUSIA

Component/ Indicator	Objectives and aggregate indices	Variables	Parameters measured
Environmental	1. Environmental quality	Number of days with bad or very bad air quality	Air quality
		Ecological status and risk of non-compliance with the WFD objectives for surface and transition waters	Water quality
		% of municipal land surface as modified	Soil quality
	2. Sustainability	Greenhouse Gases Emissions	Sustainability to cope with climate change
		% of agricultural land with high or very high risk of water erosion	Sustainability to cope with soil loss
		Total water demand/ effective rainfall ratio	Sustainable water use
	3. Smart environmental management	% protected areas and SCIs	Protected areas
		Equivalent population with wastewater treatment as a percentage of total equivalent population	Waste water treatment
		Installed power from renewable energy sources	Renewable energy
Economic	4. Competitiveness	Business electricity consumption	Economic dynamism
		Company investments in R&D funded by CDTI (<i>Centro para el Desarrollo Tecnológico Industrial</i>)	Innovation efforts
		Agro-food companies with certified quality label	Innovation efforts
		Number of patents and utility models 2000-2007 /number of undertakings 2007	Outcomes of innovative activities
	5. Employment	Employees	Employment
		Number of jobs in competitive sectors/total number of jobs	Specialization in competitive sectors
		Industrial employment location quotient	Industrial specialization
		Jobs in tourism/total number of jobs	Tourist specialization
Social	6. Welfare	Declared net average income	Income
		Standardized Mortality Ratio	Health
		% of sub-regional population with libraries and/or cinema in their municipality	Socio-cultural facilities
	7. Equity	% of population aged 65 and over that receives a non-contributory retirement pension	Social cohesion due to low proportion of vulnerable groups
		% economic migrants /total population	Social cohesion due to low proportion of vulnerable groups
		% of female councillors in local government	Gender equal opportunities
	8. Socio-cultural integration	% average participation rate in the local elections	Public participation
		Cultural and sports associations per 1000 inhabitants	Association networks

Source: Pita and Pedregal (2011b).

Finally, in order to better define the analysis of disparities in the development level, a set of variables were chosen as especially indicative of socioeconomic development and the Gini coefficient was applied to them. These variables are: the declared net income, the total number of jobs, the total number of competitive jobs, the total electricity consumption and the electricity consumption by businesses. These data come originally from the Andalusian Multi-territorial Information System (SIMA, continuously updated), but they have been extracted directly from the chapters drafted by the different authors of the mentioned Third IDTA Report.

IV. MAIN FINDINGS

IV.1. Applicability and functionality of the method for the regional scales

At the regional scale, the studies on territorial cohesion have to face a two-fold problem: to identify smaller territorial units on which to apply the analysis and to find the necessary pieces of information to pursue the analysis. Concerning the first problem, the two smaller existing administrative units in Spain are the province – with too aggregate and heterogeneous data – and the municipality – with too disaggregate data. As a result, an intermediate unit must be identified that can be used for the purposes of the analysis of territorial cohesion. In most Spanish regions, sub-regional units have been defined for different purposes, though we are not aware of any case in which the purpose was the study of territorial cohesion and this issue is worth pursuing. In our case we opted for a specific sub-regional classification with 63 territorial units, which have allowed us to sufficiently detail the levels of development and territorial cohesion.

Concerning the data collection, as they were not available at this particular sub-regional scale, it was necessary to use the information provided at the municipal scale and subsequently aggregate it. However, most of the relevant information for the development assessment (e.g. gross internal product or energy consumption) is not available at the municipal scale and this limits the analysis, although it opens up a great field for research and institutional work aimed at producing such information. In the Third IDTA Report, published in December 2011, most of the information available at the time of its drafting refers to 2006-2008. In this respect, it is imperative to explore more agile and cooperative information systems, looking for synergies among different initiatives.

The indicators used in this paper were provided by the previous publication of the Territorial Development Report for Andalusia and had in turn been defined based on a literature review on territorial development and its application with the available statistical information and consensus among the authors of the Report.

As a result, the methodological proposal on the measurement of territorial cohesion at the regional scale would include: a) the elaboration of indicators of territorial development and the selection of variables especially indicative of development at the municipal scale; b) the aggregation of such indicators and variables at the sub-regional scale selected for this purpose; c) the analysis of territorial cohesion on the basis of the dispersion of such indicators and the concentration indices applied to the development proxies; d) the completion of the analysis with the treatment of the variables used as territorial justice and equity indica-

tors, such as the access to services, facilities or transport; e) the development of indicators to measure social and institutional cooperation to complement the previous analysis; f) in communities with a lack of identification with a common project these problems should be analyzed as an addition to this proposal and indicators of social and institutional cooperation should also be designed to monitor territorial cohesion.

IV.2. Territorial cohesion levels in Andalusia

In Andalusia, the main finding is that the sense of belonging to a community and equal opportunities of different territories, as far as access to transport and basic services are concerned, are not a problem. The main problems are linked to the lack of equity in certain indicators, especially the economic ones and in particular those linked with competitiveness. In these aspects important imbalances exist in the region, given the concentration of competitive activities in very few centres. This is an important feature that should be taken into account in the design of policies aimed at economic convergence and integration.

The economic imbalances negatively reflect the environmental imbalances. It is in the environmental context where the main strengths of the region can be found: good indicators in most of the areas but with clearly negative values in those enclaves in which economic development is higher. This highlights an excessive coupling between economic development and environmental quality in the region, against which measures should be taken.

The reduction of the environmental problems in the areas with higher levels of development is urgent and, as the environment is one of our best territorial assets, it is also imperative to enhance development based on this environmental heritage, which would in turn contribute to a shift in the productive model, to which not only Andalusia, but the whole of Spain aspires.

