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Julio Alberto Soria ^a & Luis Miguel Valenzuela ^a

^a Environmental Planning Laboratory, LABPLAM, Department of
Urban and Spatial Planning, University of Granada, Granada,
Spain

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A Method for the Evaluation of Metropolitan Planning: Application to the Context in Spain

JULIO ALBERTO SORIA & LUIS MIGUEL VALENZUELA

Environmental Planning Laboratory, LABPLAM, Department of Urban and Spatial Planning, University of Granada, Granada Spain

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ABSTRACT *The metropolitan urbanization shows evidence that planning at the regional, subregional and municipal levels with its wide range of territorial, urban and sectorial competences is now longer able to significantly influence territorial development. This has led to a greater demand for alternative approaches, methods and instruments. For this research study, the metropolitan area of Granada was used as a field laboratory to assess the capacity of metropolitan planning to have an impact on metropolitan processes and dynamics. For this purpose, a method for metropolitan planning evaluation, MPE methodology, was proposed, which involves two evaluation processes. This method first evaluated the coherence of plans of different competences and at different scales within the metropolitan context (trans-scalar evaluation); it then evaluated the interaction between methods and proposals in plans and metropolitan dynamics (interactive evaluation).*

Introduction

The metropolitan urbanization as a territorial process in Europe, which began in the 1970s, has grown steadily over the past few decades (Indovina, 1991, 2005; Kasanko *et al.*, 2005; European Environment Agency, 2006a, 2006b). In traditional European cities, this has led to new dynamic growth processes as well as urban shapes, whose functionality now goes far beyond current administrative limits. This has stimulated the need for innovative planning methods that are quite different from more traditional planning systems and which could contribute to a more balanced metropolitan development from an urban, social and environmental viewpoint. However, in order to devise new methods and approaches,

Correspondence Address: Julio Alberto Soria, Environmental Planning Laboratory, LABPLAM, Department of Urban and Spatial Planning, University of Granada, Campus Fuentenueva SN, Granada 18071, Spain.
Email: jsoria@ugr.es

planners must first be aware of the optimal characteristics for metropolitan planning of different scopes (territorial, local, sectorial, etc.).

As mentioned previously, metropolitan planning focusing on different scales and sectors is less and less able to regulate territorial development in metropolitan spaces due to the following reasons: (i) globalization and the degree to which it affects local dynamics (Veltz, 1999), (ii) the dislocation of land uses and services (with the subsequent alteration of flows) as a result of new spatial relation patterns linked to communication and information technologies (Castell, 1995; Jonas, 2001; Couclelis, 2009) and (iii) the lack of territorial governance structures that are responsible for land management and its different metropolitan activities (Williams, 1999; Farinós & Romero, 2007). In this context, it seems important to develop evaluation methods for planning (especially on-going and *ex-post* methods) to face the problems indicated above: that is, evaluation methods that relate to and analyse different metropolitan scales as well as plan contents and proposals. Thereby, this article proposes a method for “metropolitan planning evaluation”, MPE methodology.

Various studies highlight the appropriateness, and even the necessity, of incorporating evaluation systems in planning (Alexander & Faludi, 1989; Baer, 1997; Lichfield, 1998; Faludi, 2006; Gupta *et al.*, 2008; Zabala *et al.*, 2008; Laurian *et al.*, 2010; Oliveira & Pinho, 2010). The main benefit derived from such systems is their power to legitimate and improve the planning process in the eyes of citizens, policy-makers and planners. In other words, “verifying planning outcomes can also contribute to the accountability of, and trust in, public managers and institutions, and should guide improvements in plans and practices” (Laurian *et al.*, 2010, p. 740). In fact, these advantages are causing government agencies to set up evaluation systems oriented towards making the public aware of the positive aspects derived from planning (Seasons, 2003; Carmona & Sieh, 2005). Despite the planning evaluation being already valuable in itself, it has an added value for metropolitan spaces, which are the focus of this study. Because of the changing territorial processes in metropolitan spaces, their planning now has a greater degree of uncertainty, and an effective evaluation system would have the benefit of detecting potential conflicts and changes as well as possible means of improvement.

This article develops a “method for metropolitan planning evaluation”, the MPE methodology. Compared with other evaluation methods considered (see the section on Description of the MPE Methodology), the MPE methodology does not analyse the success or failure in plan implementation, but it is focused on evaluating the coherence of plans within metropolitan spaces. This method can be used to evaluate the extent to which planning is able to incorporate metropolitan dynamics and processes in its contents and proposals. This method was applied to the metropolitan area of Granada (MAG), a medium-sized area in southern Spain (Feria, 2010) with 32 municipalities and almost 600,000 inhabitants.

This article is organized as follows. The next section discusses different approaches to planning evaluation and describes the MPE methodology, its principal characteristics and procedures and compares it with other methods. After a brief review of the planning system in Spain, and more specifically in Andalusia, the third section describes how the MPE methodology was applied to the MAG, and the results are analysed and discussed. The fourth section evaluates this application of the MPE methodology and the final section presents the main conclusions derived from the study.

Approach and Criteria for Evaluating Metropolitan Planning: MPE Methodology

Planning Evaluation

Although there has been criticism of the inability of planning institutions to evaluate the quality and/or success of plans (Berke *et al.*, 2006; Laurian *et al.*, 2010), various evaluation methods for metropolitan planning have been proposed as reflected in the specialized literature (Talen, 1996b; Khakee, 1998; Miller & Patassini, 2005; Oliveira & Pinho, 2010). These methods have gradually begun to trickle down and actually reach government agencies, which have become increasingly aware that there is added value in informing citizens of the benefits of plans. At the same time, evaluation methods contribute to legitimize the overall planning system (Seasons, 2003; Carmona & Sieh, 2005). Furthermore, the planning lays the foundations for a continuous improvement in both plans and planning systems. In other words, “if we do not evaluate our plans and planning processes, we miss a valuable opportunity to learn how to improve them” (Berke & Godshalk, 2009, p. 228).

Khakee (2003), Alexander (2006) and Oliveira and Pinho (2010) analyse the evolution of evaluation from three different perspectives: (i) programme policy perspective, (ii) welfare economics perspective and (iii) planning theory perspective.

Although the perspective based on planning theory is the most relevant for this article, it is necessary to comment briefly on the other perspectives. The “programme policy perspective” was described by Guba and Lincoln (1989). The original classification was more intended for programme evaluation, although it is quite useful for planning evaluation as well (Alexander, 2006). This classification describes four “generations” of evaluations from an empirical positivism to a post-positivist interaction.

The “welfare economics perspective” is the second perspective to be approached. It is based on that assumption that “every public action should maximize the collective or societal value” (Khakee, 2003, p. 343). Certain examples of such evaluation methods are cost–benefit analysis, planning balance-sheet analysis, goals-achievements matrix or environmental impact assessment. The majority of these evaluations are based on “utilitarian or modified utilitarian” methods, which are used to evaluate the effects of a plan before its implementation as *ex-ante* evaluations (Alexander, 2009, p. 236).

The “planning theory perspective” is the third and last perspective to be approached. The evolution of evaluation from the *planning theory* is more relevant than the others because it directly relates planning paradigms to evaluation models (Alexander, 1998, 2009, p. 235).

In this classification, the rational and positivist planning is distinguished as the first planning model. This planning model “assumes that plan goals and objectives translate into policies and methods, which are implemented to address specific problems and yield expected outcomes” (Laurian *et al.*, 2010, p. 743). Conformance-based evaluations are related to a rational approach to planning. The design of these evaluation methods is based on verifying if the methods, proposals and outcomes of plans are in consonance with their objectives. Conformance-based evaluations presuppose a close relation between the objectives, proposals and outcomes of the plan from a positivist perspective, given that the objectives are accepted as valid. Certain examples of such evaluation methods are described in Talen (1996a, 1997), Morrison and Pearce (2000), Laurian *et al.* (2004a, 2006b), Brody and Highfield (2005) and Brody *et al.* (2006).

The communicative planning is the second planning model to be distinguished. The plan is a framework for decision-making. According to Faludi (2000, p. 303), “the plan is supposed to be an unambiguous guide to action, so its adoption implies closure of image of the future”. Performance-based evaluations are related to the communicative approach to planning in which the various evaluation methods focus on evaluating the performance of the plan, based on its usefulness for decision-making. For this reason, it is necessary to know the conditions in which the plan is consulted by stakeholders (Mastop & Needham, 1997). Significant examples of such evaluation methods can be found in Lange *et al.* (1997), Mastop and Faludi (1997) and Faludi (2000, 2006).

In addition to these dominant approaches (rational and communicative planning), certain authors defend an integrated vision (Alexander, 2000; Lichfield, 2001), where rational planning could be more adequate when planning is converted into a technical exercise, whilst communicative planning could be more necessary in other situations where planning is a learning process where new dimensions are needed (Faludi, 2006). Significant examples that integrate into conformance-based and performance-based evaluations can be found in Oliveira and Pinho (2009) or Berke *et al.* (2006).

Unlike the welfare economics perspective, the evaluation methods classified in planning theory perspectives are on-going or *ex-post* evaluations.

The MPE design is derived from a wide range of notes, suggestions and principles pertaining to the elaboration of evaluation methods that have been described over recent years (Alexander & Faludi, 1989; Talen, 1996b; Baer, 1997; Oliveira and Pinho, 2010). The methods are clearly positioned in the debate between conformance-based and performance-based evaluations (see the section on Description of the MPE Methodology).

MPE should be used in on-going and *ex-post* evaluations and, with limitations, it could be applied in *ex-ante* evaluations. MPE has not been designed for evaluating the strategic planning, but for planning systems where plans perform as a blueprint. For that, it could be said that MPE is close to a conformance-based evaluation.

Along with principles and arguments derived from the previously mentioned studies (e.g. those related to the connection between evaluation methods and planning theory), the MPE methodology includes the following basic features in metropolitan planning evaluation: (i) the design of its evaluation criteria is focused on the connection between the metropolitan mosaic and the municipal proposal and (ii) it takes into account the trans-scalar and administrative relations of the different types of plans that make up the metropolitan reality of each context.

The following sections give a detailed explanation of the MPE methodology and its application. This method has two parts: (i) “trans-scalar evaluation” that evaluates the adequacy of municipal plans to metropolitan plans and (ii) “interactive evaluation” that evaluates the relation of plan contents and proposals with metropolitan process.

Description of the MPE Methodology

The main objective of the MPE methodology is to evaluate the capacity of metropolitan planning to influence metropolitan–territorial development at its different levels (municipal, subregional, regional, etc.) and competences (urban and territorial/metropolitan). Accordingly, the MPE methodology is carried out in three phases: (1) a selection of the municipal plan representatives of the set of territorial processes of the geographical area under evaluation, (2) a trans-scalar evaluation that evaluates the adequacy of municipal

plans for the objectives and proposals in plans at the territorial–metropolitan level and (3) an interactive evaluation that evaluates the methodological and propositional interactions of municipal plans with processes and metropolitan dynamics.

The MPE methodology is conceptually simple; it conforms to available data for planners; it can be used without special computer applications and it is also directly applicable to other contexts and situations. These aspects are very similar to the main advantages of the PIE (plan implementation evaluation) methodology proposed by Laurian *et al.* (2004b, p. 472).

It is necessary to highlight that the MPE methodology is not designed to monitor the outcomes of plans once they have been implemented, but evaluates the proposals of such plans in terms of metropolitan–territorial development. In this respect, the MPE methodology is different from the POE (plan outcome evaluation) methodology also proposed by Laurian *et al.* (2010).

As opposed to the evaluation method proposed by Berke *et al.* (2006), the MPE methodology does not evaluate the successful implementation of plans, but rather the degree to which they are adapted to or take into account the metropolitan reality of the territory.

The MPE methodology is similar to the PPR methodology (evaluation of planning, process and results) elaborated by Oliveira and Pinho (2009) in that both emphasize the physical dimension of urban growth, especially in those criteria that evaluate the conformity between municipal and metropolitan plans. Finally, in contrast to other evaluation methods, such as those proposed by Talen (1996a) and Brody *et al.* (2006) and the PBGIS (parcel-based geographical information system) of Chapin *et al.* (2008), the MPE methodology does not use quantitative analytical methods (Table 1).

The first phase of the MPE methodology involves the selection of municipal plans. The set of municipal plans selected should reflect the interactions between metropolitan reality and municipal reality in regard to the following factors:

- (1) *Metropolitan significance of the municipalities*: regarding the functions of their main nuclei of urban growth, relations with the central city, urban projects of metropolitan relevance, etc.
- (2) *Spatial coverage*: representative of the rings at varying distances from the central city as reflected in metropolitan population settlements.
- (3) *Spatial contiguity*: as reflected by metropolitan coherence of municipal planning.
- (4) *Representativity of urban growth patterns*: as reflected in the region studied (Aguilera *et al.*, 2011, p. 232). For example, this can be seen in “aggregated patterns” (new urban areas added onto an already consolidated city), “linear patterns” (urban growth around road networks), “leapfrogging patterns” (these patterns reflect the appearance of urban patches with a principally residential function) and, finally, “nodal patterns” (these patterns largely reflect existing industrial and commercial urban growth near the main transportation nodes).

Once evaluators have selected the municipal plans that will be compared with the metropolitan plans currently in force, the evaluation is performed. As mentioned previously, this is done in two phases. The first phase is the trans-scalar evaluation and the second is the interactive evaluation. Figure 1 shows the relation between plans, the MPE evaluation phases and metropolitan processes.

Table 1. Main features of the evaluation methods considered

Evaluation method	Authors (year)	Objective	Main characteristics
Method to evaluate the successful implementation of the plan	Talen (1996a, 1996b)	To demonstrate how quantitative methods can be used to evaluate the success or failure of plans	It is a conformance-based evaluation Different analytical methods are used, such as univariate analysis, bivariate analysis and multivariate analysis
PIE	Laurian <i>et al.</i> (2004a, 2004b)	To measure how the plan is implemented in practice	It is a conformance-based evaluation It proposes indicators to measure the breadth and depth of the plan implementation
Testing the implementation of local environmental planning	Brody and Highfield (2005)	To test the effectiveness of compressive planning and plan implementation	It is a conformance-based evaluation It is based on examining the spatial pattern of wetland development permits by means of GIS
Evaluation of local plans and implementation in practice	Berke <i>et al.</i> (2006)	To evaluate plan quality and implementation	The analysis evaluates the successful implementation and the quality of the plan In the study, the conceptual definition of success is provided by the conformance and performance approaches
PBGIS	Chapin <i>et al.</i> (2008)	To provide an empirical analysis of plan implementation	It is a conformance-based evaluation The method is supported by GIS
PPR	Oliveira and Pinho (2009)	To assess the production of plan—preparation, implementation and review	It comprises the <i>ex-ante</i> , <i>on-going</i> and <i>ex-post</i> dimensions It reflects a view of planning evaluation that integrates different approaches
POE	Laurian <i>et al.</i> (2010)	To assess the outcomes of local planning	It focuses on <i>ex-post</i> evaluation It seeks to answer the following questions: Have plan goals been achieved? Why or why not? Are outcomes that are attributable to the plan observed?

The next phase is the trans-scalar evaluation, which assesses the adequacy of municipal planning, based on the objectives and proposals in metropolitan–territorial planning figures. In other words, it evaluates the capacity of the metropolitan plan to regulate,

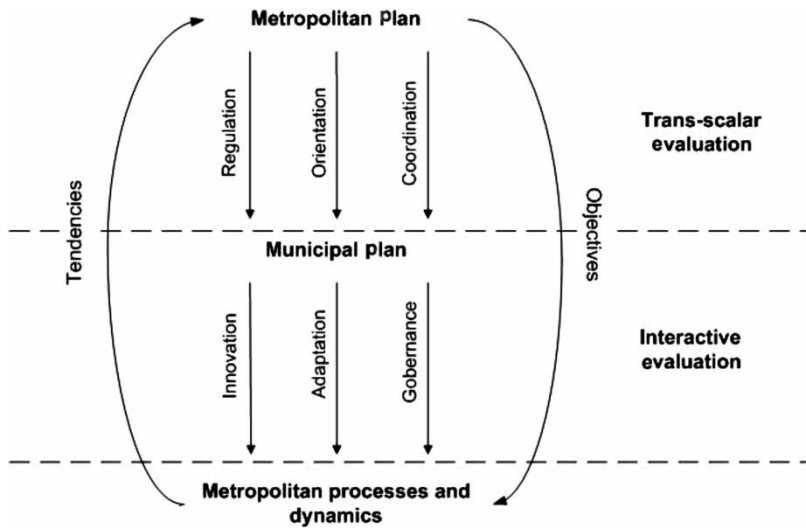


Figure 1. Diagram of the MPE methodology phases related to planning evaluation.

orient and coordinate the objectives and proposals of municipal plans. The only aspect evaluated is the degree to which municipal plans design their objectives and proposals in consonance with metropolitan objectives and proposals.

The design of evaluation criteria in this phase is thus performed with a view to analysing the capacity of the metropolitan plan to regulate, orient and coordinate the objectives and proposals of municipal plans. Accordingly, “regulation capacity” is defined as the degree to which municipal plans design their objectives and proposals in consonance with the obligatory provisions in the metropolitan plan. “Orientation capacity” is the capacity of the metropolitan plan to orient urban growth based on optional or non-obligatory provisions for municipal plans. Therefore, the basic difference between the two capacities lies in the evaluation of whether the objectives and proposals of municipal plans are in consonance with the obligatory provisions (regulation capacity) or non-obligatory provisions (orientation capacity) of the metropolitan plan. This is in relation to the system of municipal population settlements and the organization of new urban nuclei, transportation and communication networks and public and/or open spaces. Finally, “coordination capacity” is defined as the capacity of the metropolitan plan to foment contexts that involve intermunicipal coordination through the identification of shared interests in municipal plans when implementing a given metropolitan project. An example of this would be facilities clearly relevant to the metropolitan level, such as those related to health and education as well as technological and production centres.

The second phase of the MPE methodology is the interactive evaluation, which evaluates the elaboration of municipal and metropolitan plans and the characteristics of the final proposal, based on the metropolitan trends and dynamics of the area of study. The main reason for using this evaluation phase is the need to foment planning methods that can respond to complex metropolitan processes. Such methods should be flexible and innovative and lead to new forms of metropolitan governance. In other words, the interactive

Table 2. Evaluation frames, capacities and elements for evaluating

Evaluation frames	Elements for evaluating
<i>Trans-scalar evaluation</i> (Table 4)	
Regulation capacity	System of local settlements in the metropolitan area System of metropolitan infrastructures and transportation System of open spaces
Orientation capacity	System of local settlements in the metropolitan area System of metropolitan infrastructures and transportation System of open spaces
Coordination capacity	Facilities for the metropolitan area Environmental services of the metropolitan area
<i>Interactive evaluation</i> (Table 5)	
Innovation capacity	Methodological innovations Technological innovations
Adaptation capacity	<i>Ex-ante</i> adaptation of processes and metropolitan dynamics <i>Ex-post</i> adaptation of processes and metropolitan dynamics
Governance capacity	Institutionalization of forms of metropolitan government Participation in the elaboration of the plan

evaluation is organized in terms of the three capacities ideally ascribed to municipal plans, namely, the capacities of adaptation, innovation and governance.

The “adaptation capacity” evaluates the ability of plans to adjust first to metropolitan dynamics before their implementation (*ex-ante* adaptation) and second to the territorial effects resulting from their implementation (*ex-post* adaptation). Accordingly, this evaluation focuses on different metropolitan dynamics that require this twofold adaptation. Relevant examples include dynamics related to buildings and housing developments, demography and resources and energy consumption. The “innovation capacity” is defined as the level at which the plan proposes and/or uses new methods, instruments, procedures and strategies that promote and facilitate an optimal adaptation to metropolitan reality. Finally, the “governance capacity” is the capacity of the plan to foment the creation of new metropolitan–territorial government institutions as well as the mechanisms of participation for the stakeholders.

Table 2 presents the two MPE evaluation phases, along with the different capacities attributed to each and the elements to be evaluated. The following sections describe how the MPE methodology was applied to the MAG. This case study shows the adaptation of these elements to specific assessment criteria.

Finally, it should be underlined that the trans-scalar evaluation assesses the adequacy (objectives and proposals) of the municipal plans in respect to metropolitan plans, whereas the interactive evaluation assesses the interaction between plans (methods and proposals) and metropolitan processes.

Application of the MPE Methodology

The Application Context: The Andalusian Metropolitan Planning System

At the end of the 1990s and at the beginning of the twenty-first century, there was a rising concern in regard to the urban planning system in Spain. This preoccupation generated

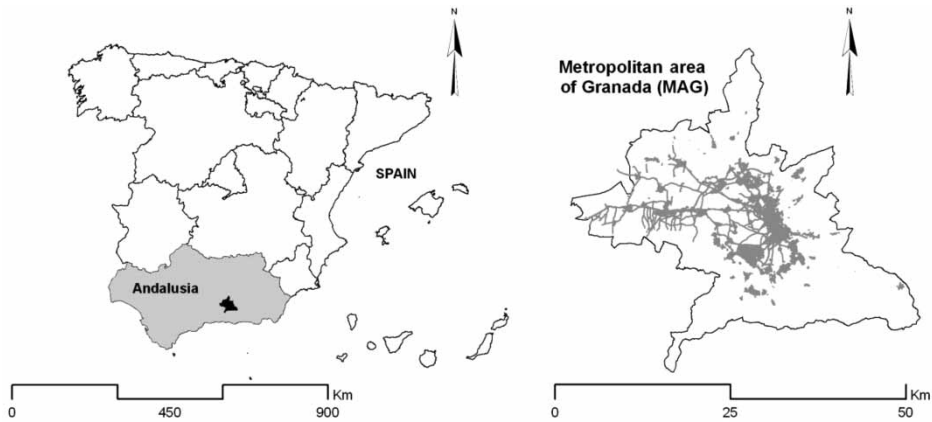


Figure 2. Geographical location of the MAG.

much debate and discussion about the evolution of urban planning in the country and led to the proposal of new objectives. This reflected the need to revise systems of state-wide planning system and to give municipal plans a more effective role in the new metropolitan reality of many cities in Spain (Ezquiaga, 1997; Font, 2003; Ferrer, 2005; González, 2007; Carreras *et al.*, 2009).

Andalusia is the region where the MAG (Figure 2) is located. The *Ley 1/1994 de Ordenación del Territorio de Andalucía* was enacted in Andalusia. Its purpose was to rectify many of the deficiencies in urban planning at that time (Benavent, 2006). As a consequence, Andalusia is one of the Spanish regions where metropolitan urbanization patterns are highest (Ministerio de Vivienda, 2006), the enactment of this law was particularly significant. This law was followed by *Ley 7/2002 de Ordenación Urbanística de Andalucía*, which was subsequently amended by *Ley 1/2006*. These new laws were passed to guarantee that municipal plans would be designed and developed in accordance with metropolitan plans. At the same time, it required the revision of all municipal plans in Andalusia to adapt them to the new planning system specified in Laws 1/1994, 7/2002 and 1/2006. Hence, it is now important to assess if these metropolitan and municipal plans have really been able to adapt to the metropolitan reality in Andalusia. Our study specifically focuses on the MAG.

The MAG was thus used as a field laboratory for the development and application of the MPE methodology for the following two reasons. The first reason is the current metropolitan urbanization, which has accentuated since the 1980s (Valenzuela *et al.*, 2007; Aguilera, 2008). The second reason is the enactment of the metropolitan plan known as the POT AUG (*Plan de Ordenación del Territorio de la Aglomeración Urbana de Granada*) (COPT (Consejería de Obras Públicas y Transportes), 1999), as well as the renovation of the majority of municipal plans and their adaptation to the Andalusian planning system. These municipal plans are known as PGOUs (*Plan General de Ordenación Urbanística*).

Application of the MPE Methodology to the MAG

This section describes how the MPE methodology was applied to the MAG. Since this metropolitan space is composed of 32 municipalities with 600,000 inhabitants, seven

municipal plans (PGOUs) were selected for our study. These plans were considered to be relevant for territorial characteristics as well as useful for the evaluation of the capacities specified in the MPE methodology. The four selection criteria were those described in the section Description of the MPE Methodology: (i) metropolitan significance of the municipalities, (ii) spatial coverage, (iii) spatial contiguity and (iv) representativity of urban growth patterns.

The municipalities whose PGOUs were evaluated were Albolote, Armilla, Atarfe, Granada, Láchar, Maracena and Peligros. Table 3 presents the main features of these municipalities as well as of their PGOUs. Based on their municipal dynamics, which account for 69% of the population of this region, in 1981–2007, Albolote and Peligros practically doubled their population with increases of 93% and 80%, respectively. This contrasted with a 3% population decrease in Granada, the central city, during the same period. Also remarkable was the evolution of the building stock, which represents 71% of the total housing in the region. For example, in 1981–2007, the total number of houses in Albolote, Armilla, Maracena and Peligros more than doubled (159%, 119%, 111% and 156%, respectively).

Once the municipalities whose PGOUs were to be evaluated were selected, the next step involved the definition of specific evaluation criteria for each of the phases and capacities defined in the section Description of the MPE Methodology as well as the application of the MPE methodology to the area of our study. For this purpose, we used the evaluation elements listed for each of the capacities in the trans-scalar and interactive evaluations (Table 2). In accordance with Baer (1997, p. 333), who states that “the appropriate criteria to evaluate a plan are implicit in the concept that the plan embodies”, these evaluation criteria specifically respond to the characteristics of the planning system in Andalusia (Spain). They are listed in Table 4 (trans-scalar evaluation) and Table 5 (interactive evaluation).

The results of applying the evaluation criteria to our case study are listed in Tables 6 and 7. In the trans-scalar evaluation phase (Table 6), which evaluates the adequacy of the proposals and objectives of the municipal plans in regard to those of the metropolitan plan, we found that there was an effective regulation capacity in reference to the transportation infrastructure and communication network, along with the system of metropolitan settlements. Nevertheless, this was not the case for the system of open spaces. In relation to the transportation infrastructure and communication network, four of the seven PGOUs evaluated (i.e. Albolote, Armilla, Granada and Láchar) include all of the proposals of the POTAUG, whereas the other three plans partially include them. These contents were related to new proposals for communication networks (Figure 3) and public transportation projects, such as the metropolitan light railway system.

The same as with the transportation infrastructure and communication network, it was found that the POTAUG effectively regulated the proposals concerning the system of metropolitan settlements. Accordingly, the majority of the PGOUs include proposals related to areas of supramunicipal endowment or spaces of industrial value specified in this metropolitan plan. One example is the case of the PGOU of Granada which reserves land to the north of the city for a logistics centre near the ASEGRA industrial park (the main industrial centre of the region). Another example is the Láchar plan that reserves land in its western sector for a centre of industrial activity.

Table 3. Characteristics of the selected municipalities and their municipal plans

Municipality (hab., 2009)	Municipal characteristics (A1–A3)	PGOU characteristics (B1–B3)	Municipal dynamics (1981–2007) (C1–C3)
Albolote (17,637 hab.)	(A1) Main centre of industrial activity. Linear and leapfrogging patterns	(B1) Residential proposals in low-density urbanization	(C1) 10480 hab. (146%)
	(A2) First ring	(B2) New centre of metropolitan industrial activity	(C2) 3800 houses (259%)
	(A3) Metropolitan light railway system	(B3) 2008	(C3) 381.62 ha (494%)
Armillá (21,380 hab.)	(A1) Aggregated and leapfrogging patterns	(B1) Residential proposals and large shopping centre	(C1) 11102 hab. (108%)
	(A2) First ring	(B2) Trade fairs and metropolitan exhibitions	(C2) 3873 houses (219%)
	(A3) Metropolitan light railway system	(B3) 2008	(C3) 159.82 ha (261%)
Atarfe (15,399 hab.)	(A1) Aggregated and leapfrogging patterns. Larger number of empty houses	(B1) Low-density residential proposals	(C1) 6406 hab. (71%)
	(A2) Second ring	(B2) Proposal of a new metropolitan settlement of 10,000 hab.	(C2) 1881 houses (159%)
	(A3) Centre for entertainment events and theatrical productions	(B3) In process of approval	(C3) 232.67 ha (203%)
Granada (234,325 hab.)	(A1) Aggregated pattern	(B1) Residential proposals for aggregative and urbanization growth	(C1) –5981 hab. (–3%)
	(A2) Main nucleus of the metropolitan area	(B2) New by-pass ring road for the city	(C2) 32579 houses (135%)
	(A3) Metropolitan light railway system	(B3) 2001 (modification 2007)	(C3) 926.57 ha (178%)
Láchar (3093 hab.)	(A1) Nodal pattern	(B1) Aggregative and industrial residential proposal	(C1) 1138 hab. (58%)
	(A2) Second ring	(B2) West industrial centre for the metropolitan area	(C2) 479 houses (182%)
	(A3) –	(B3) 2003	(C3) 102.58 ha (403%)
Maracena (20,815 hab.)	(A1) Aggregated pattern	(B1) Aggregative residential proposal	(C1) 10978 hab. (111%)
	(A2) First ring	(B2) Land reserved for new university campus	(C2) 3780 houses (211%)
	(A3) Metropolitan light railway system	(B3) Under approval	(C3) 169.65 ha (309%)
Peligros (10,910 hab.)	(A1) Leapfrogging pattern	(B1) Aggregative residential proposal	(C1) 6233 hab. (133%)
	(A2) First ring	(B2) Nothing	(C2) 2209 houses (256%)
	(A3) –	(B3) Under approval	(C3) 246.29 ha (283%)

Note: (A1), territorial model; (A2), location in reference to the central city (Granada); (A3), relevant projects for the metropolitan area; (B1), land uses; (B2), proposals of metropolitan relevance; (B3), year when the municipal plan was approved; (C1), population increase; (C2), increase in housing structures; (C3), built-up area.

Table 4. Trans-scalar evaluation criteria for the application of the MPE methodology in the MAG

Evaluation	Criterion (verification of the following qualities)	Evaluation technique
Regulation capacity	The municipal plan includes proposals to fulfil objectives regarding the population settlement system of the metropolitan plan	Comparative reading and analysis of the contents of the municipal and metropolitan plans
	The municipal plan includes proposals to fulfil objectives regarding the transportation and communication networks of the metropolitan plan	Graphical comparison of municipal plans and metropolitan plans
	The municipal plan includes proposals to fulfil territorial objectives regarding the system of open spaces of the metropolitan plan	Use of GIS to verify the agreement between the proposals of the municipal plans and of the metropolitan plan
Orientation capacity	The municipal plan harmonizes urban growth with the recommendations of the metropolitan plan	Comparative reading and analysis of the contents of the municipal and metropolitan plans
	The municipal plan harmonizes the land reserved for communication infrastructure with the recommendations in the metropolitan plan	Graphical comparison of municipal plans and metropolitan plans
	The municipal plan harmonizes its proposals regarding the protection of land of high ecological value with the recommendations of the metropolitan plan	Use of GIS to verify the agreement between the proposals of the municipal plans and the objectives and proposals of the metropolitan plan
Coordination capacity	The municipal plan reserves land for public spaces and open spaces in the intermunicipal organization proposed in the metropolitan plan	Reading and analysis of metropolitan plan
	The municipal plan reserves land for intermunicipal projects of metropolitan focus in the metropolitan plan	Identification of municipal plans with planning objectives and intermunicipal management Use of GIS to verify the agreement between the proposals of the municipal plans and the objectives and proposals of the metropolitan plan

However, the regulation capacity is much lower for the system of open spaces where the objectives of the POTAUG are modified in the majority of the PGOUs. This significantly increases the environmental impact of the municipal plans since the proposals in the PGOUs tend to hinder and discourage the design of public and/or open spaces with the environmental services necessary for the geographical context under study.

As mentioned previously, the orientation capacity of the metropolitan plan for municipal plans measures the degree to which municipal plans adopt the recommendations and non-obligatory dispositions in the metropolitan plan. This orientation capacity was found to be significantly less than the regulation capacity. Similarly, there was a certain

Table 5. Interactive evaluation criteria for the application of the MPE methodology in the MAG

Evaluation	Criterion (verification of the following qualities)	Evaluation technique
Adaptation capacity	Plans analyse the goodness of fit between the proposal and the consumption of resources and energy	Reading and analysis of the contents of the metropolitan plan
	Plans analyse the goodness of fit between demographic evolution and the building stock	Analysis of the socio-economic variables in the metropolitan plan
	Plans give priority at a temporal level to the implementation of proposals based on metropolitan dynamics	Study of metropolitan trends of variables included in the metropolitan plan
	The municipal plan proposes different scenarios—proposals to decide on Plans propose gradual scenarios, depending on the metropolitan plan and processes	Analysis of plans proposed in the metropolitan plan
Innovation capacity	Plans incorporate a system for monitoring the outcomes	Reading and analysis of the metropolitan plan
	Plans incorporate the proposals of other sectorial and/or neighbouring plans	Interviews with the authors of the plan and the members of the government agency
	Plans include an analysis of the metropolitan significance of the proposals	
	Plans use specific software applications such as PSS and/or DSS	
Plans use simulation scenarios		
Governance capacity	The citizens were surveyed during the elaboration of plans	Reading and analysis of the metropolitan plan
	Interactive means of participation were used during the elaboration of plans	Interviews with the authors of the plan and the members of the government agency
	Working committees were set up with neighbouring municipalities during the elaboration of plans	
	Work groups were created with the different government agencies involved in the elaboration of plans	
	The municipal plan fosters the creation of new organs for the management of spaces of metropolitan interest	
Plans analyse the goodness of fit between the proposal and the consumption of resources and energy		

Note: PSS, planning support system; DSS, decision support system.

orientation capacity related to the transportation infrastructure and communication network, as shown in the PGOUs of Albolote, Armilla, Granada, Láchar and Macarena. However, the orientation capacity was much less in other aspects, for example, the adjustment of municipal urban growth to the non-obligatory dispositions of the POTAUG. This is an important issue since it directly influences two central aspects linked to the territorial

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Table 6. Results of the trans-scalar evaluation

Evaluation elements	Criterion (verification of the following qualities)	Albolote	Armillá	Atarfe	Granada	Láchar	Maracena	Peligros
Regulation capacity	The municipal plan includes proposals to fulfil objectives regarding the population settlement system of the metropolitan plan	•	•	○	•	••	••	•
	The municipal plan includes proposals to fulfil objectives regarding the transportation and communication network of the metropolitan plan	••	••	•	••	••	•	•
	The municipal plan includes proposals to fulfil territorial objectives regarding the system of open spaces of the metropolitan plan	•	•	○	○	•	••	○
Orientation capacity	The municipal plan harmonizes urban growth with the recommendations of the metropolitan plan	•	••	○	○	•	••	○
	The municipal plan harmonizes the land reserved for communication infrastructure with the recommendations in the metropolitan plan	••	••	•	•	••	••	•
	The municipal plan harmonizes its proposals regarding the protection of land of high ecological value with the recommendations of the metropolitan plan	○	•	○	•	•	•	○
Coordination capacity	The municipal plan reserves land for public spaces and open spaces in the intermunicipal organization proposed in the metropolitan plan	•	••	○	○	○	••	○
	The municipal plan reserves land for intermunicipal projects of metropolitan focus in the metropolitan plan	○	○	○	○	○	○	○

Note: ○, not included; •, partially included; ••, completely included.

Table 7. Results of the interactive evaluation

Evaluation elements	Criterion (verification of the following qualities)	Albolote	Armillá	Atarfe	Granada	Láchar	Maracena	Peligros	POTAUG
Adaptation capacity	Plans analyse the goodness of fit between the proposal and the consumption of resources and energy	●	○	○	○	○	●	○	○
	Plans analyse the goodness of fit between demographic evolution and the building stock	●	○	○	○	○	○	○	●
	Plans give priority at a temporal level to the implementation of proposals based on metropolitan dynamics	●	●	○	○	●●	●●	●	○
	The municipal plan proposes different scenarios—proposals to decide on	○	○	○	○	○	○	○	○
	Plans propose gradual scenarios, depending on the metropolitan plan and processes	○	○	○	○	○	○	○	○
Innovation capacity	Plans incorporate a system for monitoring the outcomes	●	○	○	○	○	○	○	○
	Plans incorporate the proposals of other sectorial and/or neighbouring plans	○	○	○	●	○	○	○	●●
	Plans include an analysis of the metropolitan significance of the proposals	○	●	○	○	●●	○	○	●●
	Plans use specific software applications such as PSS and/or DSS	○	○	○	○	○	○	○	○
Governance capacity	Plans use simulation scenarios	○	○	○	○	○	○	○	○
	The citizens were surveyed during the elaboration of plans	○	●●	○	○	○	●●	●●	○
	Interactive means of participation were used during the elaboration of plans	○	○	○	○	○	○	○	○
	Working committees were set up with neighbouring municipalities during the elaboration of plans	○	○	○	○	○	○	○	○
	Work groups were created with the different government agencies involved in the elaboration of plans	●●	○	○	○	○	○	○	○
	The municipal plan fosters the creation of new organs for the management of spaces of metropolitan interest	○	○	○	○	○	○	○	○

Notes: ○, criterion not fulfilled; ●, criterion partially fulfilled; ●●, criterion totally fulfilled. PSS, planning support system; DSS, decision support system.

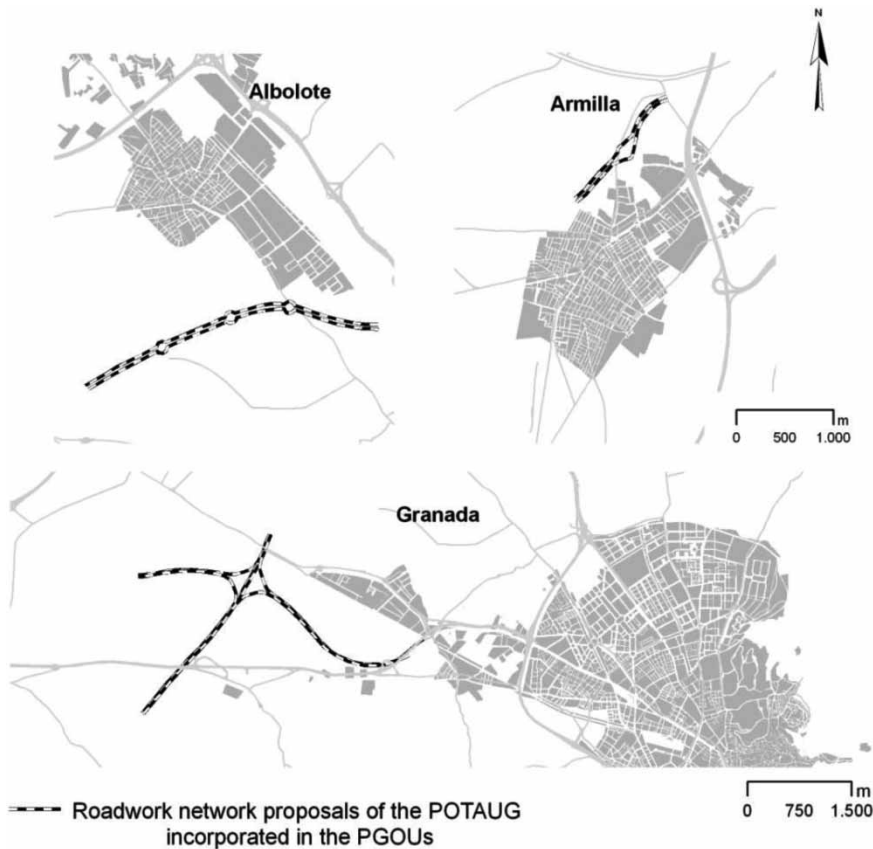


Figure 3. Roadwork network proposals of the POTAUG incorporated in the PGOUs.

development of the metropolitan area such as the system of population settlements and the system of open spaces.

Another area for which the POTAUG has a low orientation capacity regarding the PGOUs is the protection of land with a high agricultural and ecological value. This is the land where the diversity of protection categories designed by each plan for agricultural spaces with similar characteristics makes it difficult to fulfil the objectives specified by the metropolitan plan.

The coordination capacity is the last capacity measured in the trans-scalar evaluation phase. It evaluates the capacity of the metropolitan plan to promote situations in the municipal plans that involve intermunicipal coordination, for example, through the identification of places of shared interest for various municipalities. The results given in Table 5 show that the coordination capacity is very low since the analysis of the PGOUs reflects very little interest in fostering situations that entail coordination with neighbouring municipalities. In this sense, this coordination capacity is non-existent in the reservation of land in the PGOUs for projects of intermunicipal metropolitan centrality. In fact, the lack of coordination with the POTAUG is reflected in the identification of spaces that for their high agricultural value require the concerted planning of various metropolitan

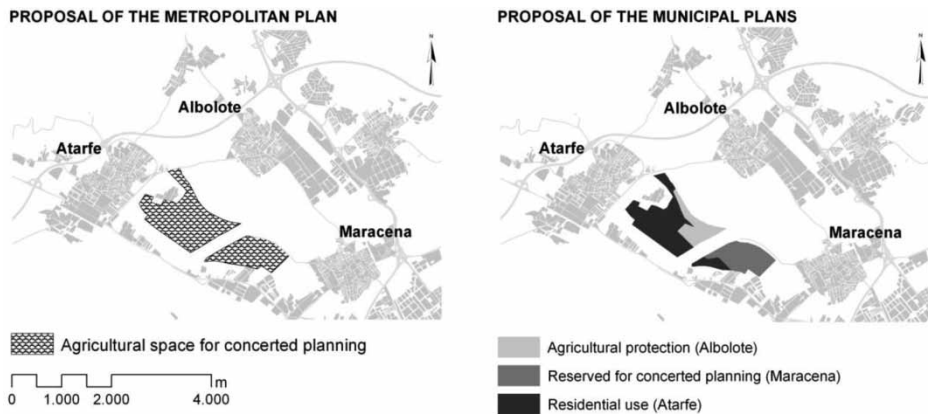


Figure 4. Comparison between the intermunicipal planning space of the POTAUG and its incorporation in the PGOUs.

municipalities. This is something that is only included in the plans of Maracena and Armilla and partially in the plan of Albolote (Figure 4).

Table 7 presents the results of the interactive evaluation phase of the municipal plans. The objective of this phase was to evaluate the process in which the plans were carried out as well as the characteristics of the final proposal based on the processes and metropolitan dynamics of the context of the study.

The first aspect evaluated was the adaptation capacity or the capacity of the plans to adapt to metropolitan dynamics as well as to the territorial effects derived from their implementation. The results obtained show that once the plans were in force, they had no adaptation capacity (*ex-post* adaptation). This was because none of the PGOUs or the POTAUG included alternatives in their final proposals or gradual scenarios that allowed the plan to be oriented, depending on the major territorial dynamics in metropolitan contexts.

Regarding the adaptation of plans to processes and metropolitan dynamics during their elaboration (*ex-ante* adaptation), the PGOU of Albolote based the justification of its residential proposal on the housing and demographic dynamics over the last 10–20 years. In most of the plans evaluated, this caused an evident lag between the urban growth of the municipality and the proposals for land occupation (Figure 5). From an environmental perspective, the plans of Albolote and Maracena were the only ones that justified the adequacy of their proposal for the consumption of water and available resources. Finally, the most successful factor in the evaluation of the adaptation capacity of municipal plans pertained to the priority given at a temporal level to the implementation of proposals based on metropolitan dynamics. In this respect, the PGOUs of Láchar and Maracena have specific programmes for the development and execution of proposals. Finally, the POTAUG only shows a weak *ex-ante* adaptation capacity related to incorporating demographic evolution criteria in order to regulate the building stock.

The second criterion evaluated was the innovation capacity of the plans. This involves the capacity of the plan to propose and/or use new methods, instruments, procedures and strategies to foment a planning that is more in harmony with complex and changing metropolitan processes. Although the POTAUG relates the proposal of municipal plans and

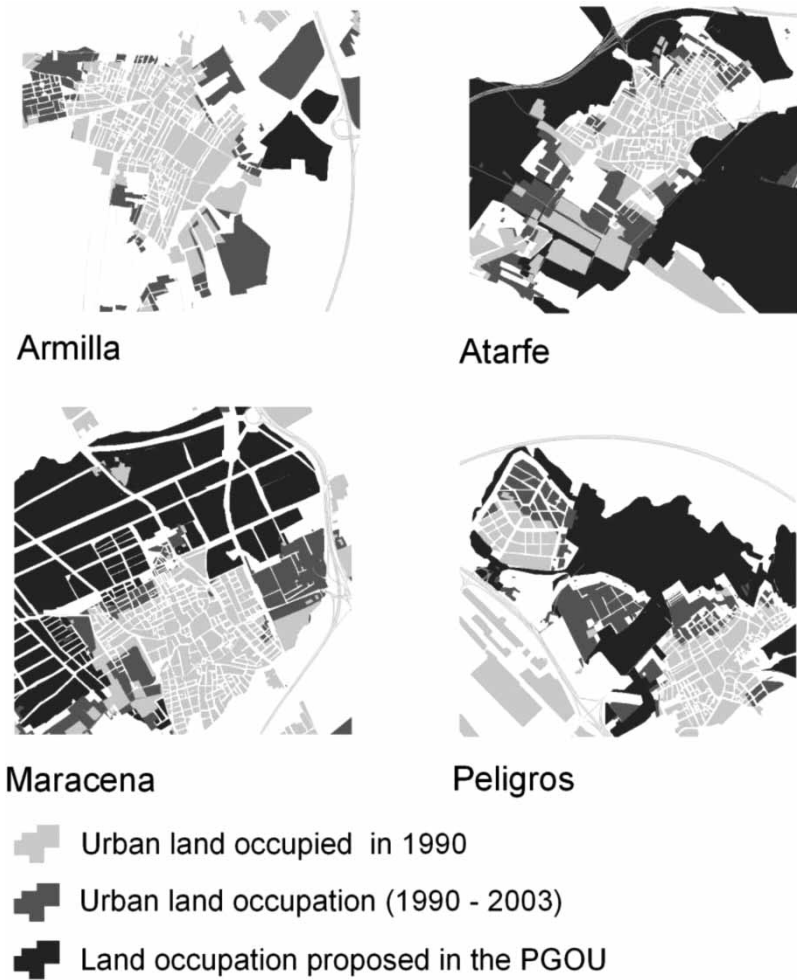


Figure 5. Comparison of land occupation in 1990–2003 with the land occupation proposals made by the PGOU after 2003.

analyses the metropolitan significance of the municipal proposal, this capacity was found to be very low in the plans evaluated. In fact, it was practically non-existent when it was a question of fomenting technological innovations during the elaboration of a plan, such as the use of planning support systems. Regarding methodological innovations, the PGOU of Albolote was the only plan with a set of indicators to monitor the execution of the plan, though it could not really be called a monitoring system since it did not have a schedule, objectives, management bodies, etc.

Regarding methodological innovations, at the municipal level, we found that only the PGOU of Granada incorporated proposals of other plans with sectorial contents, namely, in reference to the road infrastructure plan. In line with this, the plans of Armilla and Láchar are the only ones that evaluate the metropolitan significance of the plan. For example, Láchar compares the results of these evaluations with the objectives

and intentions of the POTAUG in regard to the municipality. Finally, in regard to the innovation capacity, none of the plans included proposals and/or objectives of the plans of neighbouring municipalities. In many cases, this made it difficult to favour a more balanced metropolitan development at an urban, social and/or environmental level.

The third criterion in the interactive evaluation was the governance capacity or the capacity of a plan to foment the creation of new metropolitan–territorial institutions of government at the same time as it articulates participation mechanisms for the different stakeholders. Regarding the creation of new government institutions, the capacity of the plans was found to be practically nil. The only exception was the PGOU of Albolote, which set up working groups composed of the various public administrations within the geographical context of the plan. The capacity of the plans to foment mechanisms and instruments of participation was also non-existent with the exception of the plans of Armilla, Maracena and Peligros where the citizens were surveyed to obtain their opinion concerning different aspects of the plans.

The MPE Methodology: Discussion

This section discusses the usefulness of the MPE methodology, based on the results obtained after applying it to the MAG. The main topics are as follows:

- *Simplicity and applicability.* The application of the MPE methodology to the MAG showed that this method is simple to use and relatively easy to apply. No special computer program is necessary; nor a large financial investment is needed. The simplicity of the MPE methodology as well as the nature of the results obtained also makes it interesting for three potential user groups: (1) planners, since it identifies the characteristics of their plans that can be more or less vulnerable within the context of the metropolitan–territorial reality; (2) government agencies, since it can be used to legitimize their planning process; and (3) city society groups, since it provides them with better and more transparent urban development plans. Moreover, the incorporation of quantitative methods such as those used by other evaluation methods (Brody *et al.*, 2006; Chapin *et al.*, 2008) could make the results and evaluations even more accurate. However, this would have the drawback of making the MPE methodology more difficult to apply and would possibly affect its level of applicability.
- *Exportability.* The results obtained and the application process show that the MPE methodology is an evaluation method that can be exported to other contexts. In particular, some of the main applications are (i) those related to top-down planning system in metropolitan regions (Portugal and Italy cases are close to the Spain context), (ii) relating policies, strategies and plans at different scales and (iii) coordinating objectives, methods and tools for plan elaboration.
- *Ability to detect areas of conflict and opportunity within the planning system.* This aspect is very important for the improvement of the planning system and provides information that can be used to adapt the plan to metropolitan reality. The results obtained in our study showed that it was difficult for metropolitan planning criteria to guide municipal planning because of the weakness of its orientation capacity and coordination capacity. Hence, what is evidently needed is a more regulating planning system (Muñoz & Tasan, 2010), which would offer incentives to different municipalities to develop local proposals that include the obligatory provisions of

the metropolitan plan (adaptation capacity) and, as an added value, also adopt the non-obligatory or coordination dispositions (orientation capacity) proposed by the metropolitan plan.

In this sense, territorial observatories (Keiner & Arley, 2007), which are a recent phenomenon in Europe, could be important instruments for the application of evaluation methods such as the one proposed in this study. Certain examples could be ESPON at the European level (www.espon.eu), DIACT in France (territoires.gouv.fr/la-datar) and OSE in Spain (www.sostenibilidad-es.org). At the same time, they could induce changes that contribute to the improvement of the planning system. Nevertheless, the rigidity of planning systems, along with the need to provide these observatories with an effective instrumental and methodological framework, makes it difficult to regard them as a real alternative at least for now (Soria *et al.*, 2010). However, within the context of our study, the recent creation of the *Observatorio Territorial de Andalucía* in 2009 is a step in the right direction, though it would be necessary to wait for a certain time in order to be able to evaluate its operativity and work in regard to the planning of the Andalusian metropolitan space.

- *Ability to detect the metropolitan coherence of the contents and proposals*, particularly based on the results of the interactive evaluation phase. An evident example of this issue is the results obtained in our study, which reflect that one of the most salient aspects of municipal plans is their lack of overall vision of the municipality and the metropolitan context in which the municipality is located. Indeed, in most cases, the proposals and objectives justify new land classifications with residential and/or industrial uses. This impoverishes the analysis of other municipal and metropolitan needs which go beyond the funding of new residential urban developments and which can be related to aspects such as mobility, green space, urban services, public spaces and the historical centre. Furthermore, along with this very limited global vision, another negative aspect is the fact that municipalities seem to have no metropolitan perspective, except for a few examples mentioned in the results. In most cases, this means the duplication of facilities at the municipal level and the non-existence of synergies between neighbouring municipalities, along with an absolute lack of the creation of territorial subcentres that promote a balanced metropolitan development. A more flexible design of the different types of plans in line with their objectives, contents and proposals could be a determining aspect in this sense. This is closely related to the specific characteristics of the planning system.

Conclusions

This article has presented the MPE methodology, a method for evaluating the capacity of metropolitan plans to have an impact on metropolitan processes and dynamics. To demonstrate this, we used a case study of the MAG. The first reason for choosing the MAG for our case study was the nature of its metropolitan dynamics that have been steadily growing since the end of the 1970s and the beginning of the 1980s. The second reason was its planning framework, which is regulated by Law 1/1994 on territorial planning in Andalusia, along with the revision of practically all the municipal plans to Laws 7/2002 and 1/2006 regarding urban planning in Andalusia.

This application of the MPE methodology was carried out in two parts (trans-scalar and interactive evaluations). The first was a trans-scalar evaluation that evaluated the adequacy of municipal plans to metropolitan plans. The second was an interactive evaluation that evaluated the relation between plan contents and proposals with metropolitan process.

The results of our study showed a weak internal coherence between metropolitan planning and municipal planning. We found that the regulation capacity of the metropolitan plan over the municipal plan was only reflected in certain aspects such as communications and transportation infrastructures. There was also a very low municipal coordination capacity as well as a very low orientation capacity, especially in the area of residential urban growth. Regarding the interactive evaluation, the plans evaluated had practically no capacity for innovation and governance in the face of metropolitan dynamics and processes. They also showed a weak *ex-ante* adaptation capacity.

The final part of this article opened various lines of discussion based on the results obtained. This contributes to the creation of new research lines concerning the capacity of planning to effectively influence metropolitan–territorial development. It explored possible working areas in municipal plans to make them more effective within the scope of metropolitan dynamics.

The results showed that the MPE methodology was suitable for the purposes of our research study, which involved the evaluation of the influence of planning on metropolitan processes and dynamics. It also contributed relevant information regarding the specific characteristics of the planning system that it analysed. The MPE methodology also has the advantage of being simple to apply as well as exportable to other metropolitan contexts with planning systems similar to the planning system in Andalusia.

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