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Special Issue: Sustaining small and medium-size towns: policies and prospects

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Guest Editors

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Editorial

To set up a goal such as the sustainability of small and medium-size towns (SMTs), these days, seems unlikely. While trends point to concentration around large and mega towns, much has been studied about their capacity to lower impacts upon the environment, many small and medium-size towns still nourish and foster - in the confinement of a romanticized well-being - a great part of the world population. Before our technocentric decades, the survival of such structures was questionable, assuring the agglomeration economies and correspondent energy savings of industry and services. However, the regional dimensions of spatial and temporal interactions are changing. Dispersion, will likely not have the same costs in future. Smarter cities, and their inclusion of health, education, retail, and transportation, suggest that geographical distances will become irrelevant. This is further enhanced by the human pursue of other values, such as spirituality, nature, and travel. Of course, such determinants of future humans behavior are uncertain, and any assumption about its forthcoming is risky. Nonetheless, there is a trend to look at towns, small or medium-sized, as the only existing instruments to sustainably keep nourishing our whole territories with activities and knowledge while preparing humankind for a post-capitalism future.

The scientific discussion on how to sustain SMTs is tricky, and there is no way to be either definitive or clear about the adequate strategies for regional growth. Or, in other terms, how to be sure that those high-risk investments will not stop their returns sooner than expected, the margins for profitable activities being so narrow. Leveraging the agri-food industry and tourism, in search of more skills related to information and communication technologies (ICTs), there is not much that can be done in such towns for now. But the future could reserve some good surprises if incremental local knowledge would be incorporated in the adequacy of tools for policymakers.

This leads to this Special Issue at hand entitled: Sustaining Small and Medium-size Towns: Policies and Prospects. By enabling this discussion Public Policy Portuguese Journal broadens the context of this paradigm. This issue unveils discussion about the future of small and medium sized towns (SMTs) in times where mainstream debates foster the role of large urban metropolis. It is certain that the theme concerns many decision makers who are struggling for financial support and private investment to upgrade their communities, in the hope of engaging their small towns as sustainable choices within the growing urban futures. We hope to be able to proceed further the way we are starting now and are very thankful to the editors of PPPJ and the authors of this SI for this first step. Hopefully, more will follow to clarify, discuss and build up the necessary policies to open better prospect for the SMTs.

The contemporary theoretical framing suggests the need for a comprehensive and systemic approach to innovation in such cases based on technological development paths and the networking systems for which the strategic choices of companies and the spatial impacts of their network organizations count. Not less important is the regional strategic learning depending so much on the national governance system.

The different papers presented in this special issue are important contributions to tackle the above-mentioned topics directly. The first chapter, entitled “The challenges of smart cities: Social innovation and the role of public authorities in a new conception of the city”, by Manuela Mora-Ruiz uses the example of Spain to frame the discussion of how regulation enhances, or not, the smartness of cities.

The next chapter, “Supporting policy development in the Aveiro region by modeling urban sustainability” is a very good example of how smart regions or towns should analyze their restrictions and capacities. In this case, the authors, Tania Esteves, Eric Vaz and Fatima Alves, report on a case study that tackles Ria de Aveiro as a fragile ecosystem surrounded by major metropolitan cores. Key variables influence different reactions to aid decision-making processes, and Geographic Information Systems helps to test different local policy scenarios into the complexity of spatial decision support

systems at the regional level. The third chapter by Teresa de Noronha and Eric Vaz, "Evolution of the Agri-food business landscape of Portugal at a local level shows a descriptive, macro-economic view over the agri-food situation in Portugal. Through regional desegregation suggests those areas across the country that seem to offer more propensity to agri-food production and growth, still accepting the argument that proximity and industrial clustering matter. Local clustering and networking should provide insights into the local capacity to bet on the sector to promote industry and related sectors such as biotechnology or food tourism. Just the same topic, but from a very specific perspective, is developed in the next chapter by André Samora-Arvela, Eric Vaz, Jorge Ferreira and Thomas Panagopoulos, "Turismo e património gastronómico: A valorização turística de um cabaz de doçaria algarvia". The authors evaluate the degree of preference and willingness to pay of tourists visiting the Algarve region to taste gastronomic identity when their main motivation is beach recreation. The final chapter of this special issue is entitled "Public policies in Europe's polarised political culture: the radical turn of Portugal´s left-wing bloc party in 2011" by Fatima Lampreia Carvalho. This last article aims to highly whether populist political forces in Europe can assume power or challenge liberal democracy. This may seem a discussion out of context when we intend to better understand the forces pushing SMTs forwards. However, the governance system and all it entails cannot be neglect when we know that the rural world and the small towns are becoming major pieces of the populist movement due to disadvantage, inequality, unemployment, and poverty.

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The challenges of smart cities: Social innovation and the role of public authorities in a new conception of the city. The example of Spain

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ABSTRACT

This paper examines the concept of the Smart City as a new system of territorial organization that aims to build a more cohesive society and a sustainable model of economic growth. Smart Cities play a fundamental role in the organization of physical space and land use, and attempt to balance the needs of economic growth, energy management and transport, at the same time as complying with environmental legislation. To do so, Smart Cities need to develop new administrative competences under a new conception of the relationship between citizens and public authorities, but within the framework of territorial intelligence. This paper explores key aspects of the Smart City, taking into consideration the European framework for Smart Cities, and Spanish legislation governing the competences and functions of the local authorities. It is suggested that Smart Cities can be considered a starting point for designing a new kind of urban living experience which provides different mechanisms for collective interest to be expressed and recognized.

Keywords: Cities, territorial intelligence, local government, public-private partnership, sustainable development, self-regulation.
JEL classification: K, K3

1. INTRODUCTION: THE PHYSICAL AND SOCIAL IMPORTANCE OF THE CITY IN TERMS OF CURRENT MODELS OF ECONOMIC GROWTH

Cities play a fundamental role in modern societies, not only in terms of their physical lay-out, but also in terms of their economic and social organization. It is generally recognized that cities are increasing in importance, as populations increase and as more people seek to live in cities. It is estimated that around 70% of the world's population will live in cities by 2050, entailing a range of problems concerning the organization of cities and territorial management[1]. These problems are exacerbated if we bear in mind that there are many different kinds of urban communities, from the so-called megacities (e.g., Mexico), through large cities (such as Barcelona and Amsterdam), to very little villages (Enerlis, Ernst and Young *et al,* 2012).

[1] See DIRECTORATE-GENERAL FOR INTERNAL POLICIES, *Mapping Smart Cities in the EU*, 2014, accessible at http://www.europarl.europa.eu/RegData/etudes/etudes/join/2014/507480/IPOL-ITRE_ET(2014)507480_EN.pdf.

Various authors note the rise of what can be termed the "global city" (Sassen, 2002[2]), and focus in particular on the opportunity to create social networks (Trullén, 2002[3]), and the transformative role of the state, but all agree that there is a need to look at specific solutions for specific territories, taking into consideration their physical and social conditions, their size and their particular management challenges.

In this respect, Sassen (2002) says that "the global experience cannot be applied to everything and is insufficient in the face of challenges requiring a local perspective". As a consequence, global processes need to take account of local perspectives, and the city could provide a territorial dimension for developing new conditions of living and new rights for citizen. This is the main focus of this paper, whether Smart Cities can be regarded as a holistic solution to the interrelated territorial, economic and social problems of urban living. Further, I evaluate the suitability of the Smart conception of the city to Mediterranean countries, taking into consideration their political and territorial differences, in particular the case of Spain, with its particular territorial organization into autonomous regions and municipalities. One of the key findings from this analysis is the suggestion that the implementation of the Smart City should be required to meet minimum conditions in order to guarantee a standard level of development and so avoid new causes of territorial inequality.

Urban zones are key to implementing the sustainable development objectives of the European Union Treaty as indicated by the Commission Communication of 11 January 2006 on *the thematic strategy on the urban environment* (COM(2005) 718 final) and the most recent Commission Communication of 18 July 2014, to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, on *The urban dimension of EU policies — Key features of an EU urban agenda* (COM(2014) 490 final). Therefore, there is a European legal framework, which needs instruments for its implementation, both from a legal and a social point of view.

As mentioned above, this paper aims to show how the new concept of the Smart City is able to offer a meeting point for legal requirements and social needs in which urban zones can develop (González-Gómez, 2017). It focuses on the European framework for Smart Cities and its engagement with various urban issues, and gives special consideration, in the last part of the paper, to the Spanish context, in particular the competences and functions of local governments in relation to the Spanish legal system. It will also examine local experiences of the Smart City concept, and evaluate the social innovations, which the concept offers urban territories.

2. BACKGROUND: THE CONCEPT OF TERRITORIAL INTELLIGENCE AS A FRAMEWORK FOR THE DEVELOPMENT OF SMART CITIES

The theoretical foundations of the Smart City, on which rests its aspirations as an innovative solution for the development of urban societies, can be traced to the concept of Territorial Intelligence (Girardort, 2010), which emphasizes collective deployment of natural resources to combat poverty and social exclusion at the local level. From this perspective, knowledge is less a global concept than a local instrument enabling territories to develop their own public policies by forming networks with other territories. Smart Cities, with their technological solutions to urban problems, represent a compatible and sustainable development of this concept.

The idea of Territorial Intelligence is, therefore, an alternative to the current model of economic growth, once it is clear that the local territories bear the social and environmental cost of this model (Girardort, 2010; from a different perspective, Amin and Thrift, 2002[4]). Territorial Intelligence places

[2] This Author defines the "global city" as "a border zone where the old spatialities and temporalities of the national and the new ones of the global digital age get engaged" (p.39).
[3] The author focuses on the importance of connecting the fields of geography and economics with other social disciplines, in order to rethink the territorial organization and new government formulas (pp.29-32).
[4] These Authors focus on the importance of the local economy linked to the local administrative organization.

sustainability as the cornerstone of this alternative model. The approach demands that not only legal requirements be fulfilled, but also that "the ethic of sustainability" (Girardort, 2010), is respected, prompting new relationships between public and private actors in the governance of local territories, whilst recognizing the proximity of local administration to local citizens and hence its greater capacity to meet their needs (Flor Moreno, 2013[5]).

Various authors point out the need for a socio-ecological transition in order to implement the principle of sustainable development (Carragni, 2002) and to rethink the roles of private and public actors to reach common objectives in the framework of the so-called governance model (Girardort, 2010[6]).

In this context, Smart Cities feature in public policies as an alternative solution bridging globalization and local needs, and offering an alternative model of social and ecological growth based on collective societal action. For many commentators, this social perspective is one of the most significant and innovative aspects of Smart City as it requires a multidisciplinary research approach to implement and offers a timely opportunity to rethink the legal mechanisms for achieving this collective action and governance.

On the other hand, citizens may need to play different roles in view of the shared responsibility in solving collective issues such as social exclusion and environmental problems. In this respect, "smart" solutions could offer better education (Enerlis, Ernst and Young *et al,* 2012), enhanced mobility solutions and environmental propositions for local territories, and could represent a chance to change society. The challenge here is identifying the basic features of a Smart City to achieve the socio-ecological transition as required by the Territorial Intelligence approach.

There are various strategic elements that characterize a Smart City (Miedes/Sánchez and Moreno, 2014[7]): a) first, the urban space as the physical base of the Smart City; b) second, a system of infrastructure connecting the territories; c) a complex of networks and intelligent platforms connecting the Smart City directly to the use of the Information and Communication Technologies (ICT) (Trullén, 2002; Noguera Tur, 2013); d) finally, a citizenship willing to participate in the decision making process.

Ideally, all these elements should be developed to the same level. Smart Cities can become a model of social and territorial organization if territories are genuinely valued[8] and there is real citizen participation in public policies. Such collective responsibility can provide alternative governance at local level (VV.AA, 2002[9]) and forge a new relationship between public and private actors. To do so, Smart Cities will require new legal structures in which social innovation can be enacted (Alonso Ibañez, 2012[10]). Without this, the concept of the Smart City will be used by interest groups without solving any of the aforementioned problems.

[5] The author argues for a need for more flexible and closer public management, depending on the territories in question. The approach is compatible with the concept and method of territorial intelligence (p. 257).

[6] This author proposes a model of collaboration between private and public actors to promote this socio-ecological transition (p. 26).

[7] These authors consider that, whilst Smart Cities might present a 'smart' appearance in terms of "smart grids, smart mobility, smart water, smart buildings and smart public services", if political and business interests are over-represented such cities can only achieve a partial approach to the socio-ecological transition.

[8] The author underlines the importance of reviewing current territorial organization, in order to identify territorial dynamics, the roles of the cities and their organization, taking into account the social, territorial and political aspects.

[9] In this respect, some author argues for "endogenous development strategies that the territory assumes".

[10] The author emphasises the need to change the prevalent model of urban growth to face the challenges of sustainability and climate change, and notes the importance of regulatory instruments for a cooperative model between administrations.

3. SMART CITIES AND EUROPEAN LAW

In the European Union, the concept of Smart Cities is a key strategy. It readily feeds into the Horizon2020 objectives, particularly the environmental goals and the sustainable development principle, and it fits well with principles of cooperation and participation, as there are clear social implications from Smart Cities in the framework of the Territorial Intelligence, as mentioned above.

Collective problems, such as the lack of natural resources, and the issues of renewable energy and energy efficiency, need collective solutions. This is the idea of documents such as *The urban dimension of EU policies — Key features of an EU urban agenda* (COM (2014) 490 final), whose starting point is the large populations living in cities right now and the lack of social cohesion within the urban zones.

In this respect, the point is how to understand a Smart City, and which features characterize this concept. It is impossible to give a very narrow definition of a Smart City, as the concept includes elements that can be applied differently according to the local situation of each city. Indeed, many authors agree that there is not just one Smart City, but as many Smart Cities as the number of "smart conditions" implemented, each offering different possibilities of economic and social growth.

Nevertheless, if sustainable development is the chief framework within which these Cities should be considered, as part of the process of socio-ecological transition, it is clear that some minimum degree of environmental requirements should be taken into consideration in developing a Smart City. For this reason, the chief examples of Smart Cities relate to innovations in transport aimed at improving energy efficiency and/or using renewable energy sources (Irastorza, 2017).

The notion of the Smart City is very wide and includes various, but not necessarily all, of the aspects below, such that there are differing degrees to which a city can engage with the smart concept:

a) Governance**:** Smart Cities aim to enhance transparency through the common use of information and communication technologies (ICTs). Key examples include *open data* proceedings, access to public information and the exchange of information between citizens. Such use of ICTs envisages a more dynamic and open government at local level and a shift from traditional hierarchical structures to more horizontal systems of interaction with local authorities.

b) Population (Smart people and Smart living): This area embraces several ideas, chief amongst which is the expectation of increased citizen participation as a result of the greater availability of information through the use of ICTs. At the same time, it is recognized that meaningful participation requires a higher level of cultural education, which itself is achievable through enhanced access to knowledge, e-skills, education and training. Ultimately, it is hoped that a more connected, smarter population will lead to a more cohesive society[11]. In this respect, as mentioned above, the Smart City concept can offer an innovative solution to social needs.

c) The economy**:** The principal goal of this area is to establish a sustainable economy through the incorporation of e-business solutions. In terms of the economy, Smart Cities aim for a balance between economic growth and the needs of society.

d) Transport**:** this is one of the signal features of the Smart City (Herrero Pombo, 2016[12]) and concerns improving the efficiency and reducing the costs, both economic and environmental,

[11] For instance, see *Amsterdam Innovation Motor*, that has been "set up to help preserve and strengthen the Amsterdam Metropolitan area's authoritative position in the knowledge-based economy", http://www.technopolicy.net/index.php/about-us-/3-general-information/41-institutional, visited 2 May 2, 2017.

[12] The author describes sustainable transport as "set of processes and actions directed at conveying people and goods within a territory for the purpose of accessing activities and services, performed at reasonable economic cost and with minimal negative impact on the environment and quality of life of the people involved." It is a constant element in social transformation (pp. 96, 106).

of the transport network[13], by means of integrated transport and logistic systems. From the legal perspective, a smart transport policy implies substantial legislative considerations, from planning to alternative mechanisms and the so-called command and control instruments.

e) Sustainability: another chief characteristic of the Smart City is the adoption of environmental goals, such as the use of renewable energies, greater energy efficiency and reduction in air pollution. Smart solutions can clearly contribute to protecting the environment, and can be developed at the local level as policies of the municipal authorities.

With these aspects in mind, the European Union takes a holistic approach to the concept of the Smart City, focusing on what it denominates a "three building blocks" approach, as follows: The first block is the generalized use of ICT, which reaches into all the above aspects of the Smart City concept. In this perspective, the city is viewed as one enormous digital platform that can offer numerous services to citizens from the so-called Smart cards to access certain public services to platforms providing information about the environment or traffic updates. Nevertheless, for many commentators, one of the core values of the Smart City concept is that ICT should be used in a fair and limited way. ICT is not neutral and can be dominated by certain groups, social classes or lobbies. Besides that, given that the implantation of ICT is directly connected to investment, it can exacerbate inequalities between rural and urban areas within a given territory, becoming just another neoliberal response to a problem rather than the kind of genuine social innovation which is essential for the development of territorial intelligence (González-Gómez, 2017).

Secondly, one of the conditions of Smart Cities is the involvement of multi-stakeholders and private-public partnerships as innovators of social organization. This includes the creation of spaces or forums in which public and private can meet to debate, from their respective positions and interests, collective solutions to problems. A Smart City can achieve territorial intelligence only if there is a balance between public and private actors, so that both total privatization and exclusively public ownership is impossible[14]. To this end, there needs to be the potential for self-regulation as a legal mechanism to enable direct participation across society.

The chief obstacle to achieving this objective is the identification of the multi-stakeholders, that is, the groups strong enough to take part in the decision-making process. In particular, it is important those involved are representative and minorities are not excluded. In any case, once the stakeholders are identified (both, public and private actors) they should rethink their roles in a City where ICT makes available new public services to solve new social needs. For many, the Smart City offers an opportunity to rethink governance formulas to make them more representative and open.

Finally, the sustainable development framework should be considered not only as the starting point, but also the end point of a Smart City solution. The implementation of appropriate regulations and public policies for sustainable transport vis-a-vis security and efficiency, and the notion of a smart environment through the use of renewable energy sources and energy efficiency are the cornerstones of the Smart City from the perspective of territorial intelligence.

The idea of Smart City can be regarded as a response to the problem of the growing population, as an alternative way to organize urban space (Rivero Ortega and Merino Estrada, 2016), and a means to solving collective problems and to serving collective interests. Nevertheless, it is not a simple solution due to the multiple aspects, which constitute a Smart City, and, hence, the different Smart Cities that are possible[15]. In terms of innovation, the Smart City should remain consistent with socio-ecological transition such that prospective models are constrained by the need for environmental

[13] There are many examples of smart transport solutions in Europe using ICT, such as "intelligent traffic systems", car-sharing platforms and so on, c.f. *Mapping Smart Cities in the UE*: pp. 44ff.
[14] See Mapping Smart Cities in the UE: p.9.
[15] See *Mapping Smart Cities in the UE*: "the implementation of the Smart City concept, therefore, follows very varied paths, depending on each city's specific policies objectives, funding and scope…" p. 21 *in fine.*

friendly growth, ensuring the availability of natural resources for future generations and building an inclusive society.

Not to do so is to run the risk of building inequality into the Smart City approach, with only favored territories being provided with the opportunity to achieve a given level of development. This would violate the participation principle and the ethic of sustainable development, and should be rejected as antithetical to the principles of the Smart City approach.

Nevertheless, the European Union has not detailed a blueprint of the Smart City, but instead provides minimum standards for cities to be classified thus. In this regard, the European legal framework is a useful tool for recognizing the importance of the Smart City and its potential for to social innovation and the creation of a more cohesive society, but in itself the framework is insufficiently detailed to use as a roadmap for the development of a Smart City. For this, it is necessary to examine the relevant national regulations. In this respect, it should be borne in mind that the Smart City is a social-legal concept within multi-level governance, and it is thus mandatory to examine national and local initiatives and legal solutions, once the European framework has been considered. This is the aim of the following section, with regard to the Spanish context.

4. THE CURRENT LEGAL FRAMEWORK IN SPAIN AND SOME PARTIAL EXPERIENCES: IS THE SPANISH MODEL FLEXIBLE ENOUGH FOR SMART CITIES?

4.1. General considerations about the Spanish legal system and Smart Cities

Having presented the underlying principles of the Smart City, and keeping in mind that, at a European level, rather than narrowly define the concept, it is understood more flexibly in terms of clusters of features, we can now turn our attention to the situation in Spain, as an example of a Mediterranean country, and consider land use and the model of economic growth in this country.

First, it can be noted that the Spanish legal system has strengthened the principle of sustainable development as a cornerstone of various policies concerning the Smart City with regard to the aspects mentioned above, specifically the environment, transport, renewable sources of energy and so on. In this respect, sustainable development is considered a principle underlying all public policies for urban areas, and is recognized as such by the Estate Law: The Law 2/2011 for Economic Sustainability[16] aims to establish the legal framework for the use of renewable sources of energy, energy efficiency and sustainable transport by the use of certain regulatory instruments[17] and by imposing certain obligations on public administration, as the competent body, to adopt and implement public policies regarding these issues under the umbrella of the cooperation principle and the sustainable development principle, according to article 2 of the Law[18].

In like manner, the Law on land and urban restoration, 30 October 2015[19], provides a principle of sustainable development from a territorial and urban perspective, which includes some provisions for transport and public participation in urban planning (Herrero Pombo, 2016; Alonso Ibáñez, 2016).

[16] Law 2/2011, for Economic Sustainability, 4 March, *BOE* number 55, 5 March (accessible at https://www.boe.es/buscar/act.php?id=BOE-A-2011-4117)

[17] See articles 99, 100, 101 and 102 of the Law on Economic Sustainability.

[18] Article 2 states: "For the purposes of this Law, a sustainable economy is understood as a pattern of growth that reconciles economic, social and environmental development in a productive and competitive economy that favors quality employment, equal opportunities and social cohesion, And that guarantees environmental respect and rational use of natural resources, so as to meet the needs of present generations without compromising the possibilities of future generations to meet their own needs." Likewise, regarding energy policy, article 77.1 states: "Energy policy will be aimed at ensuring security of supply, economic efficiency and environmental sustainability. In particular, the model of consumption and generation and distribution of energy must be compatible with community regulations and objectives and with international efforts in the battle against climate change."

[19] Real Decreto-Legislativo 7/2015, 30 October, approving the Consolidated Text of the Law for Soil and Urban Rehabilitation (see https://www.boe.es/diario_boe/txt.php?id=BOE-A-2015-11723).

Together, these two laws, as indicated above, represent the legal starting point for Smart Cities in Spain. The laws overtly recognize the concept of the Smart City as a model for economic growth, and they specify the legal mechanisms for achieving the ecological-transition required for the implementation of a Smart City. These mechanisms, especially those relating to the decision-making process and urban planning, focus on a more cooperative structure to develop the policies described above through increased citizen participation, different forms of administration and greater transparency in the decision-making process. In addition, the laws make provision for different levels of enforcement with respect to urban planning, depending on the goals of the specific plan, so that it is possible to distinguish between imperative planning and indicative planning with regard to energy efficiency and renewable energy[20].

However, these laws come into conflict with the existing political structure of towns and the system of competences provided by Law 7/1985, regulating the legal bases of local regimes[21]. From this perspective, although it is clearly established that the local level of public administration has the autonomy to serve its own interests, this autonomy should be exercised within the legal system created be the State and the Regions or Autonomous Communities. This could be disadvantageous for municipalities aiming to implement the holistic and inclusive Smart City of the kind proposed in this paper, as national and European law have yet to offer a finished concept and model of the Smart City, and this represents an opportunity for municipalities to develop their own territorial intelligence. In fact, several researchers focus on the idea of multilevel governance (Arugué/ Gomá/Subirats, 2017[22]).

In this respect, it can be noted that there is no reference to any of the features or items related to Smart Cities in Law 7/1985, and we can only find provisions for a few aspects of this concept, such as the competences relating to transport within municipalities (Herrero Pombo, 2016) and those relating to the urban environment: with respect to the former, Article 25.1.d) recognizes "road infrastructure and signage", as a municipal competence, and Article 25.1.g) likewise recognizes "traffic, car parking and private transport in addition to public urban transport". In effect, municipalities could design a Smart transport policy by using these competences, and equally they could increase the number of Smart elements and implement a wider concept of the Smart City if they added the competence relating to the urban environment, which is recognized by Article 25.1.b), albeit within a very narrow scope, as the urban environment includes (according to said Article) gardens and parks, urban solid waste and measures to reduce noise pollution, light pollution and air pollution.

These competences were not devised with Smart Cities in mind, as it is a new concept in the social sciences framework, but they are flexible enough to let municipalities develop policies involving smart features that go some way towards a Smart City. Additionally, municipalities have authority over urban planning (Article 25.1.a) Law 7/1985), which is key to being able to "rebuild" the city along the sustainable lines recommended in this paper.

On the other hand, Article 26 of the Law 7/1985 grants municipalities some public services according to the size of the population; those exceeding 50,000 people are responsible for maintaining public transport and protecting the urban environment. These obligations offer an opportunity to implement services in a "smart" sense, making use of the smart elements identified above, that is

[20] See Article 79 of Law 2/2011. This article states that "planning will take into account various scenarios as indicators of the potential evolution of energy demand, the resources required to satisfy it, the need for new power and, in general terms, useful forecasts for the decisions taken by private investment initiatives and for the decisions affecting energy policy, and will promote an appropriate balance between system efficiency, security of supply and protection of the environment" (2nd paragraph).

[21] Law 7/1985, 2 April, Regulating the legal base of local regimes, *BOE* number 80, 3 April, (accessible at https://www.boe.es/buscar/doc.php?id=BOE-A-1985-5392).

[22] These authors focus on the idea that the European Union is an example of transnational governance, which can be seen as the first step towards developing new strategies of government, including a leading role for the local level (pp. 307, 308).

the use of ICT, smart transport solutions, smart environmental measures and smart population initiatives.

There remains the challenge of identifying appropriate legal instruments to achieve a more cooperative and participative government at local level in order to establish smart governance (Arugué; Gomá; Subirats, 2002), whereby citizens are directly involved in the development of the city. By these means, the Smart City could be an opportunity to renovate public administration (Enerlis, Ernst and Young *et al,* 2002). Various authors have considered this issue and reached the conclusion that the local level of collective interests needs a more flexible system of local governance in conjunction with appropriate legislation to allow the involvement of private actors[23]. The kind of innovative legal mechanisms required for smart governance should include collaborative decision-making processes for urban planning (Enerlis, Ernst and Young *et al,* 2002), formulas for private-public partnerships to manage public services and systems of self-regulation. This might result in a different citizenry whose right to the city is recognized (Sasse, 2002; on the contrary, Alonso Ibañez, 2016[24]).

Although, as suggested above, local administrations would seem to have some authority, from a legal perspective, to implement Smart Cities, there are two main obstacles to be overcome. On the one hand, the current vertical political structure of municipalities in terms of its relationship with citizens is inconsistent with a system of transparent governance and collective action. The mayor and the council are at the head of the local administration and citizens have few possibilities to take part in the decision-making processes. As a consequence, there is a clear need to find legal instruments to bring about a change in the constitution of local authorities, such that they play the role of leader rather than that of hierarchical head of the administration.

On the other hand, municipalities have to develop their competences according to the legal system created by the state and the autonomous regions (Herrero Pombo, 2016, regarding some Laws of Valencia, Cataluña and Madrid), so that they lack the independence to set up a Smart City (Rivero Ortega and Merino Estrada, 2016). Nevertheless, some researchers suggest that the current regulation of municipal responsibilities could be increased as long as the autonomous regions are in agreement (Boix, 2013); this is why it is so important that some public policies relating to the Smart City could be regulated at the regional level.

In summary, it seems that the Spanish legal system at the local level is currently too inflexible to promote a full version of the Smart City featuring the kind of developments mentioned above, and this situation can be considered a limiting factor in the social innovation that we have pointed out as the main advantage of the Smart City approach. For those who believe that cities need to develop new competences under a new conception of the relationship between citizens and public authorities, it is important to find the means of changing the *status quo* of local government or to provide alternative inclusive solutions vis-a-vis the Smart City approach. This paper considers Smart Cities a cornerstone in the future design of urban areas, in which collective interests should find different means of expression and recognition; and public authorities should use other instruments, services or strategies, different from command and control systems, to achieve public goals. Otherwise, the Smart City will become just a technological solution for certain cities or urban zones within a city. In this respect, the main changes could be the following: First of all, ICT solutions should be deployed across all sectors of urban living with the objective of improving the living conditions of all citizens. In the transport sector, for example, there are numerous smart initiatives such as traffic platforms, transport information services, and route planning, all of which rely on ICT to offer the population new services. Nevertheless, there are two problems facing the implementation of ICT. On

[23] For instance, in the document *Mapping Smart Cities in the EU,* Smart Governance is linked to the transparency principle and the need for open data. For consideration of the Spanish legal framework regarding these topics (Villarejo Galende, 2015).

[24] It is important hoe the last author asserts that it is impossible to understand the city without the citizen, although there is not yet a clear right to the city from a legal point of view.

the one hand, the financial resources of municipalities in Spain widely differ in their capacity to invest in ICT and hence require the support of higher administration, both at regional and state level. On the other hand, if the Smart concept extends only to ICT, we risk the Smart City becoming exclusive to only certain technological or private interest groups, thus frustrating the wider social goals of the movement.

This paper argues that the use of ICT should be necessarily linked to the development of policies in keeping with the instrumental aspects of the Smart City approach, such as transport, the development of health or other services, and environmental information about the city. All of these are examples of how technology can be used to serve the general interest. Perhaps the main difficulty of this approach is the financial support available to municipalities, as these are numerous in Spain and their size and population vary markedly between one and another.

Secondly, there is a clear need to implement regulatory mechanisms to meet the technical challenges of bringing about change. These should enable public information and public participation across different fields of public action such as the environment (for instance, the use of renewables, energy efficiency and land use). Such participation implies a certain level of governance and the representation of different perspectives from private citizens and organizations alike, working towards a common goal. Commentators underline the necessity for systems, which can facilitate complex decision-making processes, and anticipate new administrative procedures involving forums or "meeting point zones" between public and private actors. Such processes will require innovative legal instruments to make the smart governance described above possible.

Nevertheless, there are as yet no concrete proposals for these changes; many authors focus on the need for innovation and how certain policies such as sustainable transport systems require new legislation to be drawn up, and for many the current situation is insufficient[25].

4.2. A critical review of *smart* experiences in Spain

Having outlined the legislative starting point of the journey towards Smart Cities in Spain, we now examine some initiatives that have already been set in motion in this country. These illustrate how the smart conception of a city is not a closed one, but also show how much ground has yet to be covered before the Smart City is linked to territorial intelligence. The initiatives concern the use of ICT in various sectors, in some cases for certain services and in others for specific public policy, notably transport and environmental protection.

Thus, in Valladolid there are taxis, which are 100% electric; there are green e-motion projects in Malaga and Barcelona, and car-sharing initiatives in Madrid, all of which concern the transport aspect of Smart Cities. In addition, the autonomous regions of Cataluña[26], Valencia[27] and Madrid[28]

[25] The drive towards sustainable transport in Spain is guided by the framework of the Spanish strategy of sustainable mobility (2009) aimed at reducing emissions in the transport sector by focusing on five aspects: territory and land planning; transport and infrastructures planning; climate change and reduced economic dependency; air quality and health; management of demand. The document identifies the main areas of transport policy, linking them to the process of ecological transition mentioned above. The key to achieving the goals of this policy is territorial planning, which itself requires very clear specifications. That is, transport policy (including smart transport) needs to develop a new and specific planning process which integrates territorial and land planning to manage its objectives. For some authors the strategy of sustainable mobility is not sufficient, as they would like to see a move towards a systematic approach combining sustainable and smart mobility. In this respect, see Herrero Pombo (2016b) and Alonso Ibañez, 2016, with regard to the relationship between urban planning and sustainable mobility policy.

[26] Law 9/2003, 13 June, on mobility (*BOE* num. 169, 16 July 2003; accessible at http://noticias.juridicas.com/base_datos/CCAA/ca-l9-2003.html).

[27] Law 6/2011, 1st of April, on mobility (*BOE* num. 98, 25 April 2011; accessible at https://www.boe.es/buscar/doc.php?id=BOE-A-2011-7330)

[28] Law 5/2009, 20 October, on transport and road mobility (*BOE* num. 307, 22 December 2009; accessible at https://www.boe.es/boe/dias/2009/12/22/pdfs/BOE-A-2009-20659.pdf).

have approved laws dealing with sustainable transport, underlining by doing so that transport is clearly an element of the urban economic development. The laws are consistent with *smart* principles in that they regulate the transparency of the policies and the requirements for social participation; they also make planning the cornerstone of new and innovative legislation and provide new competences for the local administration (Herrero Pombo, 2016).

Elsewhere, there are examples of energy efficient buildings in Vitoria and Malaga. However, these are in conflict with national regulations on auto-consumption of renewable energy. These regulations discourage the auto-consumption model by reducing the financial benefits of these energies and other kinds of financial support[29]. Once again, the legal framework in which the municipalities operate is quite inflexible towards certain smart features (Mora-Ruiz, 2012).

On the other hand, there are several examples of regulations regarding transparency at the local level, which, as stated above, is a requirement of smart governance. An example of this, and an aspect of the Smart City not mentioned before, is the so-called "accountability architecture", a means of achieving real governance and good administration, both at the local level, and in multilevel governance (European Union, the State and the local government). In this respect, Bilbao, Gijon and El Puerto de Santa Maria (Cadiz) stand out among Spanish municipalities as examples of open government (Enerlis, Ernst and Young *et al*, 2002) and demonstrate the importance of legislating for transparency and the right of access to public information, so that local actors become active agents of the development of cities and participate in local government.

Finally, there are some experiences of new public services using a *private-public partnership solution* with regard to the legal regulation of public contracts, especially in the areas of transport (Herrero Pombo, 2016b) and energy, such as those in Valladolid and Palencia, which have adopted mechanisms for innovative public purchases (Villarejo Galende, 2015[30]).

These initiatives are of limited value in assessing whether Smart Cities are possible in Spain. They are partial realizations of the smart approach and as such represent partial conceptions of what a Smart City might look like. Significantly, they have been achieved without introducing any deep changes to the legal model of the local administration, although they do underline the importance of local territories in the process of society. It is also worth pointing out the lack of key transformations in the Spanish legal system, which, if enacted, would put local authorities in a good position for setting up Smart Cities within the framework of territorial intelligence.

First, with respect to the "new conception of local authorities", it should be noted that the governance framework of the Smart City approach envisages new roles for local authorities whereby they negotiate, or let citizens participate in, the decision-making process.

From this perspective, Smart Cities offer a space for an informal relationship between public and private actors that needs formal rules. In consequence, public law has to establish the bases of the informal action of local authorities and collaborative solutions, the use of social networks and the new role of local authorities as leaders rather than hierarchical governments. At the moment, the Spanish legal system has yet to respond to these challenges (Rivero Ortega and Merino Estrada, 2016[31]).

A process of modernization of the administration is thus required, basically through the use of ICT (e-administration), and the search for new legal mechanisms for governance. The current legal system governing local administration is too narrow for this purpose, although it can allow certain aspects to

[29] See Royal Decree 9/2015, 9 October, on the administrative, economic and technical conditions for auto-consumption of energy (*BOE* num. 243, 10 October; accessible at https://www.boe.es/diario_boe/txt.php?id=BOE-A-2015-10927).

[30] The author points out the Regulation of Valladolid, 17 April 2015, on smart public contract procurement.

[31] In fact, the National Plan on Smart Cities has no specific provisions for the legal mechanisms to implement a Smart City, except for a general definition of such a City with respect to ICT, sustainable development and social goals.

be developed, and public authorities should encourage this. For instance, we can note the importance of planning as a new process of regulation based on territories.

At the same time, formulas for participation in the legal decision-making process and the in force phase of the law (Herrero Pombo, 2016) can be widely broadcast through the use of ICT. For example, in Valencia the Law 6/2011 on transport incorporates technology that allows citizens to participate in the policy, such as Internet information, on-line surveys and the creation of citizen's boards to be consulted by the local administration (Herrero Pombo, 2016). These are examples of smart governance that should be taken into account.

Finally, the Spanish approach to Smart Cities has one very significant disadvantage regarding local competences as discussed above. There is a clear need for a wider legal framework to accommodate new competences for local authorities regarding smart solutions, like those related to ICT, as these competences are essential for taking decisions on the way to implementing smart elements. For instance, in Spanish Law, municipalities can promote the sustainable use of technology by the enforcement of the competence of Article 25. 2.ñ) of Law 7/1985 on the bases of the Local Regime (Villarejo Galende, 2015[32]).

5. FINAL REMARKS

To conclude this Paper, I would like to make some final remarks about the Smart City conception and the role of the legal groundwork, which makes it possible.

First, Smart Cities have to be considered as part of the territorial intelligence of society (which means transparency and learning as a method), so that a socio-ecological transition can become a reality. The European Union believes in this idea (Rivero Ortega and Merino Estrada, 2016), and there are some partial examples in Spain. Nevertheless, this goal needs to be more flexible by taking into consideration the size of the city in question, so that small towns can also take on the challenge of developing Smart approaches; if not, we risk Smart Cities becoming an instrument of increasing inequality and the differences between rich and poor cities.

As mentioned above, the Smart City approach can be an innovation for urban areas if it is implemented within the ethics of sustainable development. Mediterranean Countries could adopt this Smart approach by adapting the Smart elements to the size and situation of each urban area, recognizing that there are several smart solutions if they are sufficiently linked to the territorial intelligence of each area.

Second, in this context, the law has a role to ensure a balance between the interests of all sectors of society (Boix, 2013; Gómez Jiménez, 2015). It is necessary to build the city from the citizen up, taking into consideration the new functions that are required of the public authorities, such as those concerning open data and internet information. Thus means that there should be space for alternative instruments such as self-regulation once it is regulated. Therefore, law has an important role in the implementation of the holistic perspective of the Smart City, as there is currently a complete lack of a legal definition (Gómez Jiménez, 2015).

Smart Cities, within the limits of the sustainable development principle and from a holistic point of view, are illustrating that the goals of public action are changing and that there should be a transformation at the local level of government in order to introduce the territorial intelligence approach as a challenge for social innovation and for achieving a new citizenship (Alonso Ibáñez, 2016[33]; González-Gómez, 2017[34]). In this respect, Spain still has a long way to go.

[32] The author says that the problem is how to apply these established competences to new fields of public action like transport.

[33] Some authors agree that the City cannot be understood without citizenship.

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Supporting policy development in the Aveiro region by modeling urban sustainability

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ABSTRACT

Urban settings are greatly pressured to guarantee their sustainable development, especially when considering the occurring climate change. As most European citizens live in coastal urban areas, the importance of suitably developing these regions is high. Policy enforcement is key in controlling urban growth, particularly when there is adequate knowledge of the city's urban metabolism. By defining these issues, a city's development direction may be assessed, by using helpful, long-term tools, to attain urban sustainability.
The Ria de Aveiro coastal lagoon is a delicate wetland in northern Portugal, occupying approximately 83km^2. It is surrounded by major metropolitan cores, where the most significant one is the city of Aveiro. Due to its importance, an analysis will be made to understand this region's sustainability and analyze what key variables influence different reactions to aid decision-making processes.
Geographic Information Science plays a major role in this research where exchange within disciplinary boundaries (e.g., remote sensing, volunteered geographic information, agent-based models, complex system dynamics) may be created to test policy scenarios. Integrating the study area's urban/regional processes with these techniques, different scenarios may be produced, framing adequate regional and local policy into the complexity of spatial decision support systems at the regional level.

Keywords: Decision support system; Policy issues; GIS; Agent-based models; Urban metabolism.
JEL classification: Q01, Q56, O18, C31.

1. INTRODUCTION

Climate change (CC) has recently been one of the leading issues focused on the worldwide environmental agenda. The latest Intergovernmental Panel on Climate Change (IPCC) Working Group Report defines it as "*a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer*" (Cubasch et al., 2013). Changes in the climate system phenomena include the rise of the sea level, ocean acidification, extreme events of droughts and floods, coral degradation, mass movements and avalanches, degradation of permafrost regions, among others (IPCC, 2014). Although large-scale natural phenomena – such as extreme weather events – have always existed and are an intricate part of Earths' processes, research shows that they are exacerbated by CC (De Sario et al., 2013; Mann et al., 2017). The recent occurrence of the category five hurricane Irma swept the northeastern Caribbean and southeastern USA, has caused catastrophic damage and death to local populations. For the first time in 300 years, the Caribbean island of Barbuda was uninhabitable, having basic infrastructure grids such as electricity and potable water been annihilated (Sterling & Santiago, 2017). A few days later, in the same region, hurricane Maria transformed itself from a category 1 to a category 5 in less than a day, where previously affected areas were at risk to be hit yet again. Hurricane season in the Atlantic is a normal and yearly occurrence, but seldom have hurricanes hit that region with such magnitude. Simultaneously, western USA was subject to fierce forest fires, where close to 8 100 km^2 were burned (NIFC, 2017).

Portuguese forests also faced a catastrophic year in what relates to forest fire: due to severe drought, around 4 200 km^2 of forest areas were consumed (Guedes, 2017; Centro de Estudos sobre Incêndios Florestais, 2017; ICNF, 2017) and over 110 people died in tragic fire-related events, and hundreds more lost everything, from homes to livelihoods. The 2017 monsoon season in South Asia had a reported death toll of 1 200 people, where homes, possessions, and crops were also lost (Dash & Paul, 2017). These are but a few of the recent devastating examples stemming from CC that humanity now faces (Figure 1).

Over 15 000 scientists have recently issued a notice to humanity (Ripple et al., 2017), where a warning has been given about the unsustainable ways humanity continues to undertake. These researchers claim that, if the government, scientists, media influencers and lay citizens don't take immediate action, we may face another mass extinction (the sixth in 540 million years). One of the ways to take action is through adaptation measures to CC. These measures are those that aid individuals, communities, and governments prepare for and adjust to the changing climate conditions or their effects to moderate harm or exploit beneficial opportunities (Singh et al., 2017). By implementing decisions and actions, these measures mobilize the capacity to reduce risk and vulnerability; seek opportunities; and build the capacity of nations, regions, cities, the private sector, communities, individuals, and natural systems to cope with climate impacts (Noble et al., 2014). Because of the late reaction to CC, we will deal with impacts of previous emissions for at least 50 years. It is, therefore, dire to put these measures into action (Kennedy et al., 2007).

Regarding CC and sustainable urban planning, there are several worldwide and regional policies and agreements, from which the main ones include:

a) *Europe 2020 Strategy* (EC, 2010), who's goals refer that we need to invest in Green Infrastructure by creating or maintaining valuable landscape features, contributing to ecosystem services and biodiversity (Yeung, 2001).

b) *Rio+20 Summit*, where it is acknowledged that using integrated approaches in urban spatial planning is essential to ensure that cities are sustainable, efficient and healthy places to reside (EC, 2012).

c) *Paris Agreement* (UN, 2015), who recently brought together all nations to fight a common cause – CC and adaptation to its effects –, offering enhanced support to assist developing countries to do so. It mainly aims to keep temperature rise below 2° C above pre-industrial

levels by strengthening the global response to the threat of CC. It further intends to pursue efforts to limit the temperature increase to an even lower 1,5 °C. This agreement aims to hit this target by supporting action by developing and vulnerable countries, alongside with the goals of more developed countries (UN, 2015). Over 190 countries signed this agreement; however, the USA has recently withdrawn. This is particularly unsettling because they are a major player when it comes to greenhouse gas emissions (alongside with China, Russia, and India). Despite Trump's intentions, several US cities have pledged to commit to contributing to these goals.

d) *Sustainable Development Goals (SDGs)*, an important 2015 document that was defined in New York, where the UN formalized the agenda for sustainable development. There are 17 targets that need to be globally achieved, where Objective 11 "Cities" aims to make cities and human settlements inclusive, safe, resilient and sustainable. These goals intend to reduce the number of slums in developing countries, tackle urban sprawl by increasing urban density, promote adequate solid waste management and better manage air pollution by 2030 (UN, n.d.).

e) *New Urban Agenda,* an outcome of the 2016 Habitat III cities conference, is an update from the 1996 document from the Habitat II conference (the Habitat Agenda: Istanbul Declaration on Human Settlements). It aims to create a mutually reinforcing relationship between urbanization and development, creating a global standard for sustainable urban development, aiding in the future planning, management and living in cities (UN, 2017). It will support a wide array of actors (nation-states, city and regional leaders, international development funders, United Nations programs and civil society) for the following 20 years by creating a foundation for policies and approaches that will influence far into the future.

f) *Mediterranean Strategy for Sustainable Development 2016-2025*, a 2016 action in which all member States and key stakeholders of the Mediterranean Region partook, aiming to contribute significantly to the long-term sustainable development of the Mediterranean region. It is based on the outcomes of the Rio+20 Conference and is within the context of the 2030 Agenda for Sustainable Development and the SDGs (Plan Bleau, 2016).

FIGURE 1: A – HURRICANE IRMA FORMING OVER THE ATLANTIC; B – EFFECTS OF HURRICANE IRMA IN BARBUDA ISLAND; C – FOREST FIRES IN SOUTHERN CALIFORNIA; D – FOREST FIRES IN PORTUGAL; E – EFFECTS OF THE MONSOON SEASON IN SOUTH ASIA, INDIA.

Source: A - Politi, 2017; B - O'Leary, 2017; C - Taylor, 2017; D - Diário de Notícias, 2017; E - News Corp Australia Network, 2017)

Thus, the main challenge for scientists and politicians will be to reduce negative impacts of humans on the environment, by simultaneously keeping safe the economic and social benefits derived from them (Amato et al., 2016). As suggested by Vaz (2016), spatial analysis and particularly regional decision making can have a leading role in assessing these paradigms from a local and regional planning perspective.

1.1. The problem at hand

All around the world, populations flock to cities. These areas now house more than half of the population because they are linked to higher levels of learning and education, better health, easier access to social services, and enhanced opportunities for cultural and political participation (Piña & Martínez, 2016; McPhearson et al., 2016; Liu et al., 2017). The past century has shown unprecedented rates of urban population growth, where under 3% of global terrestrial occupation has led to 78% of carbon emissions, 60% of residential water use and 76% of the wood used for industrial purposes attributed to cities (Grimm et al., 2008). The fact remains that cities have several negative aspects, namely vehicular congestion, higher pollution levels, and higher resource demand, leading to unsustainable production and consumption patterns (Piña & Martínez, 2016). More than 400 000 inhabitants in the EU die yearly due to air pollution (EEA, 2017).

Europe's future highly depends on the adequate development of urban areas. Cities are complex organisms that grow intricately (Kennedy et al., 2007; Liu et al., 2017). They are emergent, far from equilibrium and require massive amounts of energy to sustain themselves, exhibiting patterns of inequality produced through agglomeration and intense competition for space (Vaz et al., 2015; Batty, 2008; Hachmann et al., 2017). Urban dwellers are subject to the productive and assimilative capacities of ecosystems well beyond their city boundaries. As to produce the necessary amount of energy, material goods, and nonmaterial services, just to be able to sustain human well being and quality of life (Grimm et al., 2008; McPhearson et al., 2016; Tanner et al., 2014). Concurrently, significant human agglomerations are a source of human ingenuity and may require fewer resources on a *per capita* basis, when compared to smaller towns and cities, or even their rural counterparts (Grimm et al., 2008).

Demands for land in and around cities are increasingly acute where fast, evident and conflicting changes shape landscapes uncontrollably (EEA, 2006; EEA-FOEN, 2016; Niza, et al., 2009). This economic growth and demographic change will produce ever-greater demands on services that ecosystems provide, both nearby and distant (Grimm et al., 2008; Yan et al., 2018). Urban sprawl characterizes recent urban development worldwide, with patchy, low-density mix of land uses, leapfrogging over areas and leaving agricultural enclaves (Catalán et al., 2008; EEA, 2006; Vaz et al., 2014; EEA-FOEN, 2016). When these areas grow faster than their managers can cope with, environmental issues arise, presenting a major challenge when making land use more sustainable (EEA-FOEN, 2016).

Hence, sustainability is now imperative in today's society, involving environmental, social and operational management strategies. Protection and maintenance of the landscape's integrity is a social responsibility and a commitment to pass on our heritage to future generations (Vaz et al., 2012). Urban sprawl suggests an unsustainable model of cities, urging to rethink urban planning and growth to improve a city's overall performance and efficiency to create more competitive, equitable and sustainable urban areas (Piña & Martínez, 2016).

1.2. Sustainability in cities

Sustainability is a core term used nowadays to relate to the way planning and development should be perceived. But what does it truly imply? The term sustainability development became broadly known after The Brundtland Report (Brundtland, 1987), where it was defined as "*development that*

meets the needs of the present without compromising the ability of future generations to meet their own needs". However, nowadays this definition is too broad and confusing when looked upon different perspectives. What are our needs, opposed to what we want? How many future generations should we consider? There have been many definitions of sustainability since then, as sustainability science pursues to untangle this issue (Walker, 2017). In general, one can say that researchers largely agree that sustainability relies on social, economic, environmental and governance factors (EC, 2015).

For this paper, the authors will adhere to the definition set by Piña & Martínez (2016), which define a sustainable city as being the "*combination of economic development, social development, and environmental protection that includes all human rights and fundamental freedoms, including the right to development and the right to work, so that all its citizens can meet their needs without compromising the wellbeing of the natural world or the living conditions of other people, currently or in the future*". According to these authors, the goal is to have a compact city, with a high-density, mixed-use and intensified urban form where activities are located close together to ensure better access to services and facilities through public transport, walking, and cycling, making utility and infrastructure provision more efficient (Piña & Martínez, 2016).

Thus, to achieve a better and more sustainable management of cities, there have been some Worldwide and European frameworks that were created to address these issues. Examples of these are the 2030 Agenda for Sustainable Development, the Europe 2020 strategy, the 2015 Paris Agreement, the New Urban Agenda for the EU and the Mediterranean Strategy for Sustainable Development 2016-2025.

Portugal, a southwestern European country, has benefited from the EU pressure in applying such frameworks into national legislation, mainly in what concerns environmental policies. During the 1990s, the country incurred in a major effort in developing national environmental planning, reinforcing its environmental institutions, establishing a revised, modern environmental legislative framework, adapting physical plans covering the entire country and investing in, and programming, water, and waste-related infrastructures. More recently, the strategy is mainly based on prevention and pursuit of sustainable development, looping in environmental concerns in the decision making process and the adoption of environmental management and eco-efficient solutions (Correia et al., 2009). Main regulations regarding cities and the environment include the National Program for Spatial Planning Policy, the Sustainable Cities 2020 Strategy, the 2020 National Strategy for Adaptation to Climate Change and the several Coastal Area Management Programs. Effecting sustainable urban development measures in Portugal still faces some challenges; while displaying the instruments for a sustainable urban development, there are several issues in applying these policies. The lack of public financial resources to promote adequate urban development is also a problem, especially since the country's economic recession in 2011, having to have innovated to do the same, but with fewer resources. Some cities also display a lack of technical skills and knowledge, as well a lack of opportunity to work within a network to transfer knowledge (Ecorys & CEDRU, 2011; Campos et al., 2016). However, the discussion of environmental and sustainability issues and implementation of the resultant adequate measures are taking a slow, but steady, rise in Portugal (Correia et al., 2009).

1.3. Urban metabolism

The input complexity and their interrelationships challenge the identification of causes of urban environmental problems and on how to address them without causing greater deterioration (Zellner et al., 2008; Liu et al., 2017). Reporting on the state of the environment aims to analyze and describe environmental conditions and trends of significance and to serve as a precursor to the policymaking process (Kennedy et al., 2011). An integrated systems approach seems adequate to understand the complex interrelated problems that cities face (Rotmans et al., 2000). This is urban metabolism: "*the*

total of the technical and socio-economic processes that occur in cities, resulting in growth, production of energy, and elimination of waste" (Kennedy et al., 2007). It involves quantifying a city's inputs, outputs, and storage of energy, water, nutrients, materials and wastes, therefore explaining the interactions between human systems and natural systems (Liu et al., 2017). These studies are valuable for assessing the direction of a city's development by creating a helpful tool for long-term, integrated vision for sustainable public policies and activities (Kennedy et al., 2007; Zhang et al., 2015). Substantial momentum to urban metabolism studies is underway, where it is studied in detail in, e.g., projects for the European Union's Seventh Framework (SUME, n.d., and BRIDGE, n.d., projects) (Kennedy & Hoornweg, 2012).

Parameters of urban metabolism meet the criteria for good sustainability indicators. To portray an adequate representation, these need to be (Kennedy et al., 2011): scientifically valid; representative; responsive; relevant to urban planners and dwellers; based on data that is comparable over time; understandable; and unambiguous. It is important to further integrate social, health and economic indicators in urban metabolism, once health and economic impacts are inherently related to this concept.

Thus, indicators are "*a parameter, or a value derived from parameters, which points to, provides information about, and describes the state of a phenomenon/environment/area, with a significance extending beyond that directly associated with a parameter value*" (EC, 2015). They are vital in developing sound science-based urban planning and management.

Because indicators need to be representative of their study area, we can say that there is no "one size fits all" method for developing a sustainability plan, as each plan should respond to the region's unique needs. The need to understand the natural, social, and economic frameworks in which resources are consumed is crucial. Thus, both policymakers and local stakeholders should be involved in urban metabolism research to ensure that planners understand the implications for those who will be affected by their plans (Zhang et al., 2015). In general, it is important that decision-makers trust in and understand the indicators that inform policies, once, by having broad political support, they tend to be more successful than those solely produced by academic institutions or non-government agencies (EC, 2015).

1.4. GIScience in practice

Monitoring urban development to assure cities are sustainable in the future is an absolute necessity. Decision support in this domain requires spatial information for forecasting urban development trends (Panagopoulos et al., 2016; Vaz et al., 2015; Vaz, 2016). In his 2011 published article, Batty (2011) assesses the role of Geographical Information Science (GIScience) in an urban environment through two examples of the Greater London region, evaluating how sea level rise from climate change may affect the general population, as well as modeling different energy regimes. Both situations show the importance of how coupling larger scale models to form integrated assessments of the impacts of climate change across a range of spatial and temporal scales can be useful in planning sustainability in an urban setting. The use of agent-based models, cellular automata, and micro-simulation models are now used recurrently in urban policy and planning, having a consistent dialogue between model builder and model users. They are therefore increasingly used to inform, rather than predict (Batty, 2012).

Land use plans are intrinsically spatial, and when dealing with urban metabolism issues, the spatial visualization component of GIScience is determinant to support spatial planning and decision-making (Fisher & Unwin, 2005; Vaz, 2016; González et al., 2013; Li and Kwan, 2017; Sousa et al., 2013b; Campos et al., 2016). Environmental and socioeconomic issues and impacts are considered simultaneously, so integration of evaluation methods and tools in GIS allows juxtaposing traditional quantitative thinking to decision making through computational methods (Vaz, 2016). The creation of tailor-made decision-making tools is essential to systematically analyze baseline information and

foresee potential impacts. It also satisfies multiple-scale, multi-period, multiple-objective and multiple-user needs (Chrysoulakis et al., 2014). Therefore, it is a powerful driving engine in the technical and socio-organizational implementation of integrated platforms for informed analysis (Fisher & Unwin, 2005; González et al., 2013).

Major advantages in using GIScience in urban metabolism studies include (Caputo, 2016; Chrysoulakis et al., 2013; Yan et al., 2014; Li & Kwan, 2017, Batty, 2011):

a) A geovisualization aspect of GIS, with the use of tangible visual representations and human visual abilities to generate insights about geographic problems. Visualization may be in 2D or even 3D, greatly enhancing our ability to comprehend complex issues and patterns;

b) Fast correlation to known local particularities, such as morphology, prevalent economic activity, history and tradition, recent significant modifications, features, etc.;

c) Select weak areas or performant areas to better research their features and orient local policies;

d) Easy accomplishment of sensitivity analysis and simulation of scenarios, varying the benchmarks and levels of importance of the parameters considered by the model;

e) GIS determined features such as radiative exchanges, surface carbon concentration, surface characteristics, surface turbulent sensible and latent heat fluxes, urban heat island and heat waves, precipitation and air quality aid the assessment of urban metabolism components;

f) A wide variety and combination of tools and models can be used to properly assess urban metabolism, taking elements from different software packages and building these directly into models as needed, creating an abundance of possibilities when it comes to performing good representations and simulations;

g) Depending on the analysis type, large-scale operational models may be used (e.g., with agent-based modeling) or, when necessary, finer scale models to simulate movement patterns and change, particularly local movement of individuals and specific changes in urban development (e.g., cellular automata models).

Agent-Based Modeling (ABM) application in GIScience has been gaining popularity in system analyses, where it is seen as a new age of simulations (Dragićević, 2008). Its ability to replicate the processes and dynamics that occur within a geographical system (Heppenstall et al., 2012) is a desirable trait in such studies, where the urban system's complex, non-linear behavior is addressed (Arsanjani et al., 2013). In ABM, the system being analyzed is modeled as a collection of autonomous decision-making entities called agents, where each one of these agents can interact with each other and their environment, by individually assessing its situation and deciding an outcome based on a set of rules inputted into the system. The behavior of the whole system results from the aggregated individual behavior of each one of these agents (Ausloos et al., 2015).

This type of bottom-up analysis enhances the ability to better understand local phenomena and movement representation, in a scale-independent and non-constricted way (Heppenstall et al., 2012; Arsanjani et al., 2013). Instead of reducing the system to the idea that the city operates from the top-down and results are filtered to its components, ABM adopts a reassembly approach. This leads to an individualistic bottom-up approach to the planning of urban forms and public policy (Crooks, 2010).

As in several types of modeling systems, many challenges may arise when developing an ABM. These may be of the epistemological and ontological perspectives, refinement of the theory, conceptual designs, implementation, and knowledge translation for spatial planning and policymaking. Technical issues are also important, where concerns such as model verification, calibration, validation, error, uncertainty, replication, comparison, and scale relationships need to be carefully addressed (Dragićević, 2008).

ABM has been the resource to undertake many recent studies in several realms, such as in GIScience, ecological and social systems, social and human sciences, urban systems, or land use systems and science (Dragićević, 2008). It has taken a long time developing, from Thomas Schelling's 1971 model to define segregation patterns, into present studies in, e.g., environmental modeling or the impact of policy in geographical areas. Heppenstall et al. (2012) mention a wide array of applications for ABM.

ABM's use in urban metabolism studies to aid planning and public policy has only recently been recognized. Innovative projects under the European Community's Seventh Framework Program (FP7) such as *SUME - Sustainable Urban Metabolism for Europe* or *BRIDGE – sustainaBle uRban plannIng Decision support accountinG for urban mEtabolism* (both from 2008 – 2011) are pioneering, once studies of this magnitude for major European cities were scarce at the time.

The SUME project was designed to explore how urban resource is being influenced by urban form and analyzes how future developments can influence urban resource efficiency. More specifically, the project aimed to develop a spatially explicit approach to determine the effect of urban form on resource use and to use it in scenario analyses, modeling, project and policy analyses, demonstrating how future changes in urban form could contribute to more resource-efficient European cities (Mollay et al., 2011). SUME explicitly incorporated a notion of space and considerations on the technical aspects of urban development in close relation to other key determinants of urban resource consumption (e.g., income, lifestyles, cost efficiency) to understand the web of trade-offs ultimately defining the urban metabolic dynamic of a city. The spatially explicit urban metabolism analysis with ABM was performed in four major European cities – Vienna (Austria), Stockholm (Sweden), Oporto (Portugal), and Newcastle (United Kingdom)– which represented a typical example of the four considered urban agglomerations types (Mollay et al., 2011). The SUME Synthesis Report (Mollay et al., 2011) proves an interesting read, where considerations from scenario building, model run, case study results and policy analyses are made.

The BRIDGE project intended to incorporate sustainability aspects in urban planning processes, accounting for some well-recognized relations between urban metabolism and urban structure. It also aimed at devising innovative planning strategies for urban planning and design in Europe. Urban metabolism issues were considered, where the components Energy, Water and Carbon and pollutants (SO_2, NO_x, CO, O_3, PM_{10}, $PM_{2.5}$) were focused. A Decision Support System (DSS) was created to support the decision-making needed to achieve the challenges for the different components, by proposing quantitative measures and guidelines for sustainable use of energy and materials in urban planning. Five European cities were selected as BRIDGE case studies: a high latitude with rapid urbanization city that requires a substantial amount of energy for heating (Helsinki, Finland); a low latitude Mediterranean city that requires a substantial amount of energy for cooling (Athens, Greece); a representative European megacity (London, United Kingdom); a representative European old city with substantial cultural heritage (Firenze, Italy) and a representative Eastern European city with dynamic planning process reflecting the economic, social, and political changes held within last two decades (Gliwice, Poland) (Mitraka et al., 2009). Unlike the previous project, BRIDGE used cellular automata (CA) to simulate broader and long-term land use changes for local land-use scenarios (Mitraka et al., 2010).

Apart from the cited research projects, many other published papers attest to the novelty in the use of ABM in urban metabolism studies.

The limited number of analysis carried out for Portugal within a GIS and agent based models deserves particular interest. Although some studies use ABM to study carsharing operations (Martinez & Viegas, 2017), explore and predict tourism patterns (Boavida-Portugal et al., 2017), assess land use and ecosystem changes in the agricultural landscape (Acosta et al., 2014), or to analyze and better understand the Portuguese/Spain Electricity Market (Sousa et al,. 2013a), none used GIScience for their studies. Additionally, most of the few studies that exist mainly focus on large urban settings, such as, for instance, Lisbon and Oporto. In fact, after careful research, there was only

one city in Portugal whose urban metabolism had been studied through ABM and GIS, which was Oporto (as part of the SUME project). To the authors' knowledge, there is no other city in Portugal that has been subject to this type of analysis, speaking to the novelty of the present study.

Given the importance of small and mid-sized cities for the sustainability and growth of Portugal's city landscape (de Noronha and Vaz, 2015), cities such as Aveiro should be further assessed. Situated along the coast of mainland Portugal, located between the two major cities of Lisbon and Oporto, it has a major seaport and a vast ecological richness surrounding the urban setting (see section 3 for further study area analysis). Given the potential for economic, touristic and environmental activities, it is important to assess how to manage planning and policy actions throughout the territory as to enhance sustainability. As mentioned previously, no such study has been performed in this area, and given the richness of the surrounding ecological and cultural patrimony; it is an ideal study area for this type of analysis.

2. MAIN OBJECTIVES

The research questions that triggered this study were the following:

1. How can we use GIScience to determine the urban metabolism for a set of sustainability indicators?
2. How can this aid in sustainable planning for the region?

Similarly to the study made by Piña & Martínez (2016), as an ultimate goal, the findings of this study intend to aid both researchers and policymakers. For the first, it may provide interesting insights into the current literature in environmental, economic and social assessment, as well as development elements to measure sustainability in regional contexts. The latter may benefit by using clear information produced to design more effective environmental protection policies in cities, so that economic performance may be balanced with sustainable performance.

Hence, tailor-made information systems to effectively delineate strategic methodologies for territorial coordination are required to adequately understand a region's sustainability (Catalán et al., 2008). For that, the use of GIScience is key to integrate urban/regional processes with remote sensing (RS) techniques, Volunteered Geographic Information (VGI) and ABM approaches to produce different scenarios, being an innovative combination of factors for a city's sustainable development (Figure 2).

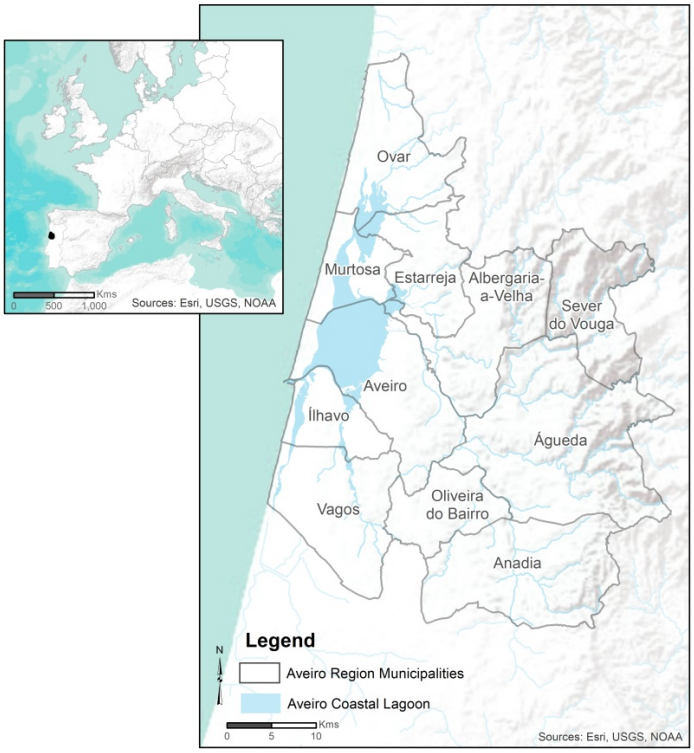
Using GIScience will allow to effectively provide support in planning decisions, by enhancing visualization. It can take alphanumeric data, flows, and processes and transform them into a visual aid, geographically pinpointing the cause/effect of a given occurrence. This way, GIScience becomes an integral part of planning and resource allocation, especially with the increasing pressure to address environmental issues and alleviate social inequalities (Campagna, 2006).

There are few cities that have urban sustainability studies by using GIScience, creating a huge research gap. For this research, the coastal Aveiro Region (Portugal) will be the chosen study area.

3. STUDY AREA

With approximately 371 000 inhabitants (INE, 2011) and a large coastal lagoon spreading across the territory, the Aveiro Region is located in the northwest coast of Portugal (40°38'N, 08°45'W) and is integrated into the Vouga river catchment area. It lists 11 municipalities of the NUTS III unit Baixo Vouga (Águeda, Albergaria-a-Velha, Anadia, Aveiro, Estarreja, Ílhavo, Murtosa, Oliveira do Bairro, Ovar, Sever do Vouga and Vagos), which occupy a total of around 1 690 km^2 (Figure 2). The Aveiro Region is a mix and match of urban and natural and semi-natural habitats, agro-systems, woodlands and freshwater rivers and lakes.

FIGURE 2: AVEIRO REGION STUDY AREA AND ITS MAIN TERRITORIAL ELEMENTS.



Source: Tanya Esteves, 2017

The diversity and biophysical abundance are marking characteristics of the territory. Perhaps the most important territorial feature is the shallow coastal lagoon, Ria de Aveiro. It stretches throughout almost 120 km^2 and includes 158 740 inhabitants in its adjoining parishes (Alves et al., 2014). It is of extreme ecological importance in the Region, once it is included in the Nature 2000 network as a Special Protection Area (SPA) and is a Site of Community Importance (SCI), presenting a wide variety of habitats used as nursery areas by several species of bivalves, crustaceans, fish and birds (Alves et al, 2014; Sousa et al., 2016; ICNF, 2012). The Region also incorporates the São Jacinto Dunes Nature Reserve and the Ramsar Sites Pateira de Fermentelos Lake, and Águeda and Cértima Valleys (Sousa et al., 2016, Albuquerque, 2013; ICNF, 2012).

The urban settings are connected through a rich network of roads, where the most important are three highways (A1, A29/A17 and A25) that give the Region excellent road accessibility, connecting them in a North/South direction (with Oporto and Lisbon, for example), and another crossing in a West/East direction, connecting to Spain (Albuquerque, 2013). Another important feature is the presence of one of the six major Portuguese ports (Aveiro). The richness of the territory yields high economic benefits, both from land and maritime activities, presenting higher economic growth than the national mean (Alves et al., 2014; Sousa et al., 2016). The main economic activities in the territory include agriculture and livestock, fishing, maritime port activity, industry, tourism and recreation (Sousa et al., 2016).

Being such a large study area, spatial management and planning is a challenging issue, once it involves programs and plans of national, regional, inter-municipal and municipal levels (see Sousa et al., 2016). In what refers to the governance framework, the Aveiro Region is currently involved with a wide range of government departments, such as the Portuguese Environmental Agency, the Regional Development Coordination Commission of the Centre, the Aveiro Region Intermunicipal Community, non-governmental agencies and other stakeholders (land owners, fisherman and sports

associations). Moreover, the previously mentioned municipalities also have jurisdiction over different parts of the territory (Sousa et al., 2016).

In brief, the Aveiro Region is a complex socioecological ecosystem, source of leisure, food and raw materials, vitally linking transport and trade. Its environmental values are extremely important, and their complex relationships should be understood.

4. METHODOLOGY

The scope of this study is taking the urban metabolism's basic concept and applying it to the Aveiro Region. By using GIScience, a step further beyond the ordinary urban metabolism methodology will be taken, giving it a new approach. GIS tools will be the novel features used for determining how policy issues influence the environment, health and economy of the study area, providing information more efficiently and comprehensively, and enhancing the spatial implications of a planning intervention (González *et al*., 2013). Questions to be answered are related to how to boost the territory's sustainability capability, allowing proper city growth.

This research is divided into three strategic parts:

a) *Part one:* characterization of the inputs to the model, using GIS (e.g., with RS and VGI). Actors' relational aspects will be considered, pinpointing specific occurrences.

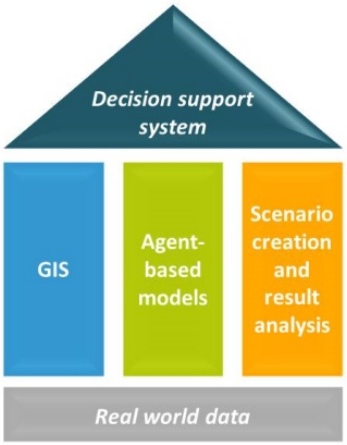
b) *Part two:* ABM creation and validation to simulate territorial activities (population movement, reaction to policy enforcement, consumption habits, …), replicating the study area's reality.

c) *Part three:* information analysis from previously built scenarios, focusing on local policy changes and information provided by local stakeholders. These results help understand how the territory is affected, for appropriate decision-making.

After a detailed state of the art analysis, three main outcomes will emerge. Firstly, there will be a focus on the study area's characterization, using innovative RS techniques and VGI. Therefore, suitable base data will be used to retrieve information for the following work stages. Phase two will create the ABM, focusing on a more subjective aspect of the territorial relationships. Again, VGI will aid greatly, helping discern behavioral patterns of the Aveiro Region's general population. Hence, the territorial current situation will be considered, leaving it to the third and final stage to attest how local policy changes may affect future scenarios, to aid the local decision-support system in respect to the environment and the general population's well being.

The three essential pillars of knowledge (Figure 3) will be structured into six different tasks. The first task, State of the art, will study what innovative techniques are being used when applying GIS in urban sustainability. As referred, preliminary analyses show that there aren't many of these studies, which is proving a difficult and exhaustive search for applicable publications to conclude an introductory review. Nonetheless, this difficulty might serve to attest to the ground-breaking nature of this research.

FIGURE 3: ESSENTIAL PILLARS OF KNOWLEDGE FOR THE STUDY.



Source: Tanya Esteves, 2017

Task 2, data survey and analysis from RS techniques will be performed (e.g., LIDAR technology), along with studying the available software solutions. This dataset compilation of the land use map will be submitted to an exhaustive analysis as to understand how each parameter may affect the final map.

VGI data mining in the third task is used to collect information from various sources. Additionally, geolocation information from social networks may also be collected to further enhance and robust the resulting data. Information will be stored in a database to facilitate the study of the spatio-temporal behavior of study area's inhabitants.

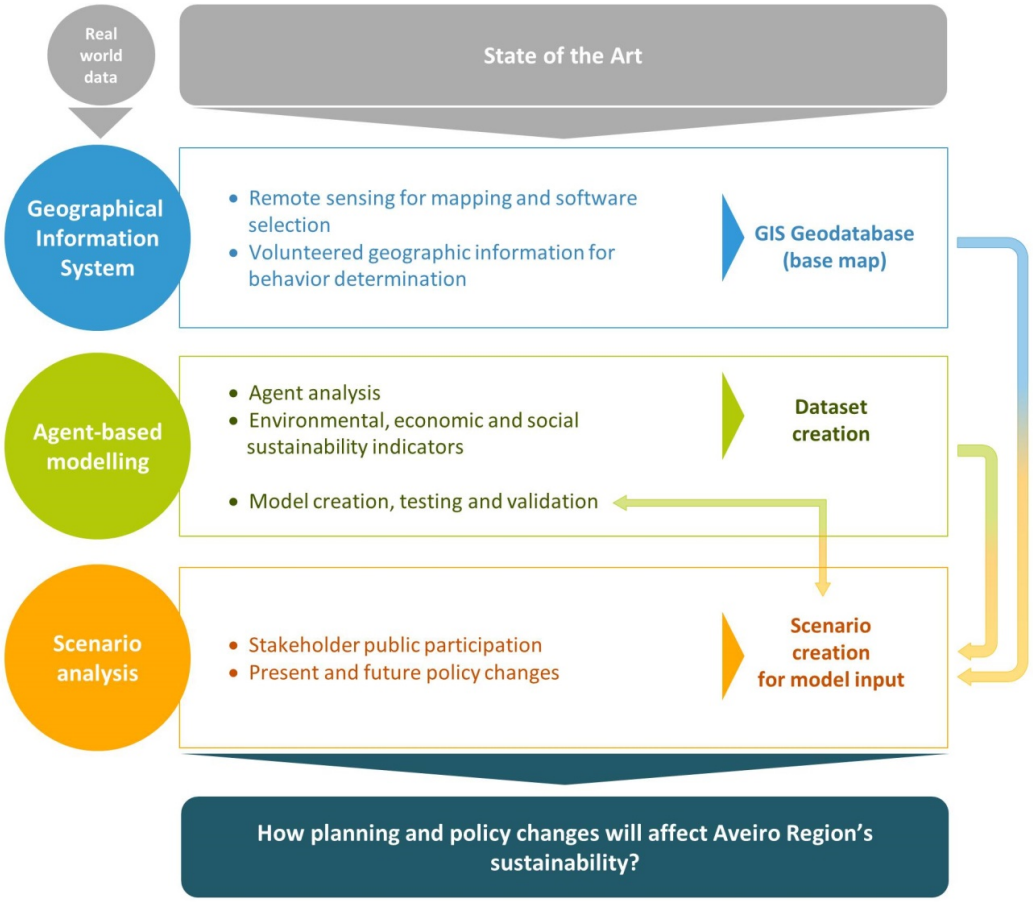
The study and application of innovative RS techniques to create characterization maps for the study area will be made in task 4. Along with the collected VGI information, a GIS database will be created.

Task 5 will perform a data survey and analysis for the ABM. Existing agents that influence the study area will be collected and analyzed, as well as the specific regional environmental, economic and social sustainability indicators that will be used for the study area, to adequately represent it. Here, the collected data will be evaluated in-depth to fully understand its utility. A dataset will also be created.

The next task will see the ABM model being created and validated. By using previously created datasets, an ABM will be created to simulate the activities for the Aveiro Region. Testing is also done at this stage, so that results are adequately validated.

The seventh and final task, will count on the collaboration of local stakeholders through public participation actions, to analyze present and future policy issues. Data provided will be valuable once they are already active in the territory where sustainability issues and analyses are concerned. Stakeholders' input data will greatly contribute to obtaining accurate results, so that the scenario creation phase may output representative information. Scenarios will be constructed to understand how those policy issues affect the local environment, health, and economy. These considerations are expected to aid local decision support systems. Besides the public participation sessions, a constant dialog will be had with the stakeholders throughout the whole process to determine the most representative features of the territory. Figure 4 presents a general outline of the study stages to be done in this project.

FIGURE 4: GENERAL OUTLINE OF THE STUDY STAGES TO BE DONE FOR THE PRESENT RESEARCH.



Source: Tanya Esteves, 2017

4.1. Additional Notes

The ABM above agents have not yet been directly related to the concept of the present study. Here, the agent will be the citizen of the Aveiro Region. Attributes such as behavior, statistics, and geographic data will be used to represent their day-to-day actions to apply rules that correspond to the residents' interactions. These will be supported by other data representing their environment: grid data layers that represent the natural (land use), infrastructure (zoning density), social (crime rate), proximity (distance to home) and policy (zoning) information.

Choosing the correct urban sustainability indicators is also of great importance. Wrong indicators may transmit wrong/insufficient information, hampering the final decision-making process. Considering Minx et al. (2011), three major indicator groups should be analyzed, relating to Environment; Socio-Economy; and Human Well-Being. Information like infrastructure determinants of the region, urban quality, therefore, human health and well-being should be some interesting results obtained.

From these indicators, some are foreseen to be used as a given for this study, such as water consumption, waste production, energy consumption, population information, transport accessibility/facilities, land-use and existing green spaces. Additional indicators will be taken into consideration when analyzing previous research projects in the study area. The focus here is to use already existing information and use it as input for this study.

We still need to consider the uncertainty factor when it comes to studies of this type. Reality representation is a complex problem, consisting of a series of cause-effect relations that include chaotic elements (Nakamori & Sawaragi, 2000). Stahel (2005) states that, because our universe is made of "systems of systems", every different element participates simultaneously in the (re)organization of different systems and performs different roles in each of them. This way, many pitfalls may occur when conducting a model representation, where we need to consider the fact that all elements are equal or held constant is a fundamental and unavoidable condition for any model creation, where the analysis requires a delimitation of the subject or a simplification of reality.

Inherent biases in the personal standpoint of the researcher surge, being challenged to distinguish between known and perceived causes or significant *vs*. insignificant processes (Aumann, 2007). A recognition of both uncertainty and imprecision are key structural elements of modeling, where aspects of natural and social phenomena will always be out of reach, and small differences in initial conditions can result in widely divergent emergent effects through time, making predictability limited (Haggis, 2010).

5. Future Challenges

In Portugal, there has been major growth of coastal urban cities, where in 2000, 50% of the Portuguese urban areas were concentrated near the coastline, representing just 13% of the total land area (EEA, 2006). A more recent report showed that this rate had enhanced between 2006 and 2009 (EEA-FOEN, 2016). This human presence and activity cause an enormous amount of pressure and impacts on the surrounding territories. These sensitive coastal areas should be carefully protected and used efficiently, once they are a rich ecological and natural resource, representing a century-old attraction for relaxation.

Being such an important feature of the Aveiro Region's territory, it is dire to protect the ecological richness of the Ria de Aveiro coastal lagoon general area. By understanding how systems are linked, and how they react to changes, policies and planning related to the protection and exploitation of this area may be better managed, so that minimal negative impacts affect it, while simultaneously guaranteeing human well-being and creating a thriving circular economy. The creation of malleable and adaptive long-term tools such as the one proposed in this research is useful so that adequate planning may be managed for this territory.

The regional scale for this study presents a challenge. Competencies of policy makers, inter-departmental tensions, changing existing institutionalized practices and the strength of entrenched policy coalitions are all factors that create barriers and divide governance and the actions taken. In the present study, due to the multitude of municipal entities that are present in the region, each one has its own Municipal Master Plan. However, the Aveiro Region Intermunicipal Community has created a strategy (Territorial Development Strategy for the Aveiro Region 2014-2020) (Aveiro University, 2014) and a pact (Pact for a Territorial Development and Cohesion of the Aveiro Region Intermunicipal Community) (Centro 2020 et al., 2015) to assure an integrated action upon the region, despite its dimension and the number of governmental organs within. This multilevel governance may be able to expose divisions and deliver awareness into the opportunities and contradictions that arise when implementing urban sustainability across several scales and levels of governance.

The potential of allying ABM to GIScience is vast. The complex interactions may be modeled to show spatial inequalities determined by economic, geographical, institutional and social factors. Furthermore, the non-linearity in the agent's decision process may also be taken into account. The novel alliance of these technologies will enable planners and policy makers to verify the consequences of their decisions. Upon completion, this study will certainly present itself as a valuable tool to aid the decision support systems in regional urban areas that aim for sustainability.

Urban sustainability is a huge task indeed, once several things need to change simultaneously - people's perception/behavior; legislation; economic policy; planning rules; ... Although it seems like a daunting task, it is not impossible. In any case, we do not seem to have a choice (Bogunovich, 2009).

Acknowledgments

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Evolution of Agri-food business landscape of Portugal at a local level

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ABSTRACT

The aim of the paper is to investigate the agri-food sector in Portugal using a spatial analysis of the Portuguese municipalities to identify local clusters of excellence. A dynamic analysis from 2004 to 2012 is provided and we have been able to highlight structural change and identify future gains for municipalities. Finally, we aim to contribute to policy decision makers by introducing the view of local advantages to foster regional growth. Our study includes an analysis of all municipalities and their data on Employment and Gross Value Added for the considered period. As to measure the advances and the declining conditions we applied a set of tools composed by three indexes: the Location Quotient, the "Municipality share Shift analysis" in Agri-food employment and local spatial autocorrelation. The first two offer a general understanding of the location of the municipalities with an elevated presence of Agri-food workforce and elaborate on what are the areas with the highest shift of Agri-food employees. This is then furthered by a local spatial autocorrelation analysis through finding hotspots (Getis, 1992) show the area of Portugal clustered to the Agri-food sector and the most relevant Agri-food subsectors in different regions. The present work is divided into four sections: The first, section is an introduction presenting the objective and the methodology adopted for the paper; The second section develops the application of the Location Quotient and Municipality shift-share analysis to desegregate the actual agglomeration of the workforce. This is followed by the third section, where the usage of spatial analysis of Agri-food economic participation at a municipal level, allows to assess the spatially-explicit characteristics of the Portuguese Agri-food clusters in depth. Finally, we conclude with the prospects and capacities of the Agri-food clusters in Portugal.

Keywords: Cluster, Agri-food, Spatial Analysis, Location Quotient.
JEL classification: R12, R14, Q16, Q18, O13

1. INTRODUCTION

It is essential to understand the impacts that Common Agricultural Policy measures had upon the structural change of the Portuguese primary sector. Among other considerations, we should point out the natural movement of labour resulting from a country, which in the last thirty years has profoundly increased the contribution of services for the Gross Domestic Product (GDP). The impact of this adjustment on the regions shows an increasing tendency for an asymmetric development,

characterized by growing population rates in the coastal areas compared to the hinterlands, prey of a constant exodus in the recent decades. Alentejo, Beira Interior, Trás-os-Montes are the three regions to demand from public policy a more attentive intervention to avoid stagnation, particularly the Alentejo which has been historically an agricultural region. With a land use structure of large properties, (*latifúndios*), it was the main cereal production region of the country until the seventies. Today, Alentejo is famous for its quality of meat and wine products, together with the still existing, and very extensive production of cork oaks (*Quercus suber*). Local branding has led to creating a regional identity, which has been integrated by existing regional policies, and improved commercial circuits while encouraging the growth and strategy of Alentejo's regional brand. However, the inherent tendency of lack of activities and products remains. A new aspect related to the multi-functioning of agriculture is bringing new hope to the diverging regions. Linking ventures of the primary sector to others related to tourism, sports activities, socio-cultural activities, renewable energies, forms, may bring new multi-dimensional integration of regional growth. Furthermore, it seems clear to decision-makers of the significant potential hidden at the peripheral universities, and up to the last five years, there has been a ubiquitous interest in promoting these institutions. The goal consists of transforming these Universities as knowledge spill overs, supporting the integrative growth of periphery and rural regions throughout Portugal, benchmarking on innovation and entrepreneurship in regional and lagging areas. Rural Portugal was only considered for agricultural activities for centuries, however, the growing number of Universities interested in promoting entrepreneurship and spin-offs of skills adapted to the regional interests in the last years have brought a new agenda of rural development.

Based on an overall view, we can say that Portuguese agricultural activities are not only decreasing their relative participation in the GDP but also decreasing their absolute value. Forestry could constitute an exception and vegetable production has reduced at the same time that there was an increase of animal production. These transitions suggest not only a profound structural change in the productive system but moreover, indicates a lasting trend towards northern consumption habits – a reaction taking place in the country since the eighties and due to a substantial investment of European distribution chains in the commercialization of food production. The Agri-food sector of Portugal is mostly located in the South-Central part of the country (Alentejo Central, Alto Alentejo, Baixo Alentejo, Leziria do Tejo, Alto Tras os Montes, Oeste) with the exclusion of Douro sub-region, in the North. The percentage of the workforce employed in Agri-food activities in the regions just mentioned range between 7 and 23% (*Instituto Nacional de Estatística*, 2012) with higher values considering only the municipalities analyzed.

As pointed out through cluster analytics (Porter *et al*., 2004) the necessity of taking into account the agglomeration economies is relevant to recognize patterns in term of shared market areas, exchange of knowledge and ideas. The importance of geographical proximity through technological spill overs and assimilated knowledge in the production's process can boost local economy, exploiting comparative advantages and dealing with external economies. Furthermore, the existing cooperation within a cluster (horizontal, vertical, and institutional) can improve competitiveness and R&D applications augmenting regional development and reducing transaction costs, contributing at the national growth and attracting Foreign Direct Investment. Territorial dynamics contribute to the building of resilience that refers to the capacity of an economy to "bounce back from adversity on its own" (Offutt.S, 2005). This process can arise from networks strengthening in a national and international perspective. Portugal has shown successful cases in Wine and other Agri-food clusters where the complex system of the cluster composed by firms, institutional and research actors collaborate to reach a high level of quality, competitiveness and exploiting local advantages in term of existent resources or creation of knowledge.

2. METHODOLOGY AND DATA

In the present paper, the method used to investigate Agri-food sector structure and its variation are twofold. The first step consists in the identification of Agri-food local place using the Location Quotient of the year 2012. After a comparison to the results of 2004, we have applied the "Municipalities shift-share analysis" in the Agri-food employment that represents the difference between the growth rate of the municipality in food employment and the growth rate of Portugal in Food employment matching 2004 and 2012 respectively as initial and final years. (Gouzhary, 2010). In a second step, utilizing Geographic Information Systems and spatial analysis, the 278 municipalities of Portugal and their connection with Agri-food business (in term of number of Agri-food employment disaggregated per subsectors and Gross Value Added) are mapped, and hotspots shown.

Data on Agri-food industry are built from the *Instituto Nacional de Estatística* at a 2-digit level of analysis:

Portuguese classification of economic activities	**Code-CAE Rev.3**
Agriculture, farming of animals, hunting and related service activities	1
Fishing and aquaculture	3
Manufacture of food products	10
Manufacture of beverages	11

2.1. Methodological tools: description of the applied indexes

As mentioned in the methodological approach we have applied four indexes to evaluate Agri-food sector. The first method to individuate the hot Agri-food municipalities is the Location Quotient applied to Agri-food industry.

$$LQ = \frac{e_i/e}{E_i/E}$$

Where "*ei*" is the employment in Agri-food industry at the local level, "*e*" is the total employment at the local level, "*Ei*" is the employment in Agri-food industry at a national level, "*E*" the total employment at a national level[i].

This measure can present some problems regarding sample since it does not take in consideration that a municipality with a low number of total employees can be included in the higher values of the Location Quotient.

To overcome this problem after the calculation of the Location Quotient for all the 278 municipalities of Portugal was adopted the threshold of 500 employees to present the top scores (Boix, 2014) on the higher quartile.

This first step was advantageous to center the localities of Portugal mostly involved in the Agri-food industry.

[i] If the value of the LQ > 1, it means that the municipality is more specialized in the agro-food sector than the national average.

The second index inspired by the work of Gouzhary. I and Margarian. A, it is a convenient stuff to analyze employees change over a given period (in our case 2004-2012).

It is composed of two factors: The Growth rate of Agri-food employment at a national level:

$$R^i = (E_t'^i - E_t^i) / E_t^i$$

Where "Et'i" is the value of total employment in the Agri-food sector in Portugal in the terminal year (2012), "Et*i*" is the the value of total employment in the Agri-food sector in Portugal in the first year considered (2004).

The Growth rate of Agri-food employment at a municipality level is the second element, and it is structured as follows:

$$r^1 = (e_t'^1 - e_t^1) / e_t^1$$

Where "et'i" is the value of total employment in the Agri-food sector in the municipality in the terminal year (2012), "et*i"*is the the value of total employment in the Agri-food sector in the municipality in the first year considered (2004).

Then the Agri-food shift share is composed by the difference of "r1" and "Ri" and it is applied to each municipality[i].

The third tool is the Local Getis-Ord Gi (Getis, 1992), calculated in a weighted set of features able to reveal whether landscapes with high values or low values tend to cluster in a study area.

This tool provides its analysis looking at each feature within the context of neighboring features, and if the value of an area is high (low) and the values of its neighboring features too, it is individuated a Hot (cold) Spot[ii].

$$G_i(d) = \frac{\sum_j w_{ij} x_j}{\sum_j x_j}$$

Where "*wij"* is a symmetric one/zero spatial weight matrix with ones for all links defined as being within distance d of a given "*i"*; all other links are zero including the link of point "*i*" to itself (Getis, 1995).

This index, applied in the GeoDa software, has allowed the mapping of Agri-food clusters along the Portugal municipalities considering the number of employees and Gross Value Added as variables of interest.

3. RESULTS

3.1. Locate the Agri-food structure along Portugal municipalities: the Location Quotient approach

To assess Agri-food industry location, we calculate the location quotient considering the data of employment for the year 2012, and consequently we provide the top list of municipalities with the higher location quotients (all the municipalities put in the list have more than 500 employees in the Agri-food industry).

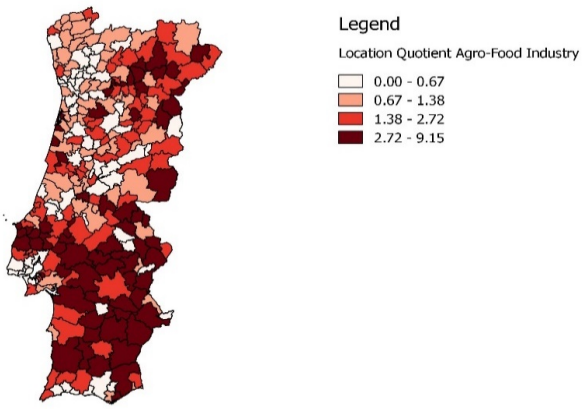
[i] The original version of Shift-Share Analysis also presents a third component, the industry mix, the difference between growth rate of industry i employment (in this case Agri-food) and growth rate of total employment.

[ii]. The local sum for a feature and its neighbors is compared proportionally to the sum of all features; when the local sum is much different than the expected local sum, and that difference is too large to be the result of random chance, a statistically significant Z score is the result

Figure 1 shows clear evidence of how the Agri-food businesses are concentrated in the south of the county with some hotspots on the northeast.

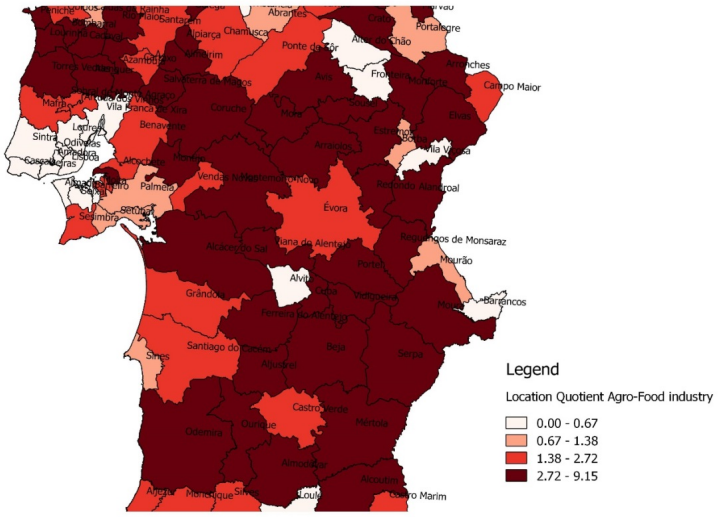
The district more involved in the South part are Beja, Evora, Portalegre, the north part of Lisbon and the south of Santarém, while in the Centre Castelo Branco and in the north part the intersection area between Vila Real, Bragança, Viseu, and Guarda.

FIGURE 1. LOCATION QUOTIENT CALCULATED ON INE DATABASE (2012)



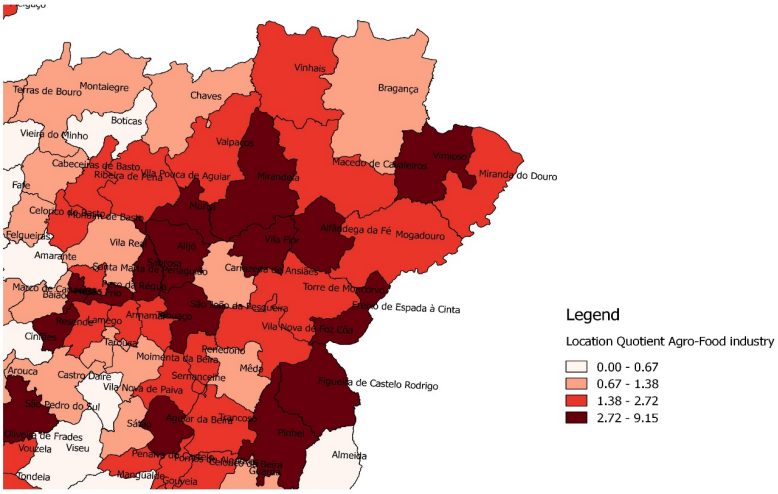
Source: Elaboration of the authors

FIGURE 2. LOCATION QUOTIENT ON INE DATABASE (2012): A FOCUS ON THE ALENTEJO REGION



Source: Elaboration of the authors

FIGURE 3. LOCATION QUOTIENT VISUAL RESULTS ON INE DATABASE (2012): A FOCUS ON THE CLUSTER OF THE NORTHEAST PART



Source: Elaboration of the authors

It is evident how the Agri-food businesses are concentrated in the south of the county with some hotspots on the northeast. The district more involved in the South part are Beja, Evora, Portalegre, the north part of Lisbon and the south of Santarém, while in the Centre Castelo Branco and the north part the intersection area between Vila Real, Bragança, Viseu, and Guarda.

TABLE 1. INDUSTRY CONCENTRATION BY 2012 LOCATION QUOTIENTS: TOP SCORE

Rank	Municipality	NUTS III	Region	LQ
1	Ferreira do Alentejo	Baixo Alentejo	Alentejo	9,150
2	Alpiarça	Lezíria do Tejo	Alentejo	8,357
3	São João da Pesqueira	Douro	Norte	8,268
4	Vidigueira	Baixo Alentejo	Alentejo	7,825
5	Sousel	Alentejo Central	Alentejo	7,148
6	Alijó	Douro	Norte	6,844
7	Reguengos de Monsaraz	Alentejo Central	Alentejo	6,663
8	Redondo	Alentejo Central	Alentejo	6,581
9	Moura	Baixo Alentejo	Alentejo	6,236
10	Serpa	Baixo Alentejo	Alentejo	6,143
11	Odemira	Alentejo Litoral	Alentejo	5,973
12	Resende	Tâmega	Norte	5,684
13	Rio Maior	Lezíria do Tejo	Alentejo	5,428
14	Ferreira do Zêzere	Médio Tejo	Centro	5,184
15	Lourinhã	Oeste	Centro	5,163
16	Alcácer do Sal	Alentejo Litoral	Alentejo	4,846
17	Murtosa	Baixo Vouga	Centro	4,844
18	Estremoz	Alentejo Central	Alentejo	4,667

19	Almeirim	Lezíria do Tejo	Alentejo	4,626
20	Coruche	Lezíria do Tejo	Alentejo	4,584
21	Peniche	Oeste	Centro	4,221
22	Cadaval	Oeste	Centro	4,187
23	Elvas	Alto Alentejo	Alentejo	4,057
24	Azambuja	Lezíria do Tejo	Alentejo	4,052
25	Peso da Régua	Douro	Norte	4,019
26	Montemor-o-Novo	Alentejo Central	Alentejo	3,898
27	Ílhavo	Baixo Vouga	Centro	3,615
28	Beja	Baixo Alentejo	Alentejo	3,544
29	Salvaterra de Magos	Lezíria do Tejo	Alentejo	3,390
30	Olhão	Algarve	Algarve	3,368
31	Montemor-o-Velho	Baixo Mondego	Centro	3,206
32	Montijo	Península de Setúbal	Lisboa	3,027
33	Bombarral	Oeste	Centro	3,014
34	Mira	Baixo Mondego	Centro	2,966
35	Alenquer	Oeste	Centro	2,919
36	São Pedro do Sul	Dão-Lafões	Centro	2,841
37	Torres Vedras	Oeste	Centro	2,784
38	Mirandela	Alto Trás-os-Montes	Norte	2,751
39	Óbidos	Oeste	Centro	2,700

Source: Elaboration of the authors on *Instituto Nacional de Estatística* (2012)

The table 1 shows that the 50% ca of the top municipalities in LQ terms (2012) are located in Alentejo, with the number of top municipalities equally distributed around Sub-Regions: 5 in the Baixo Alentejo, 5 in the Alentejo Central, 5 in Lezíria do Tejo, 4 in the Alentejo Litoral. We register important values of LQ also in the Sub-Region of Oeste (6 municipalities are in the top list) and Douro (with three municipalities).

3.2. Dynamics of employment in the Agri-food sector in the period 2004-2012

As we notice in the methodological notes to evaluate the difference among 2004-2012 in term of employment at a municipal level, we used a Shift analysis in Agri-food industry.

TABLE 2. THE MUNICIPAL SHIFT-SHARE ANALYSIS IN AGRI-FOOD SECTOR IN 2004-2012. THE TOP LIST.[i]

Region	NUTS III	Municipality	diff. 12-04	Municipal shift in Agri-food
Lisboa	Grande Lisboa	Oeiras	860	0,267
Alentejo	Alentejo Litoral	Odemira	845	0,536
Norte	Ave	Vila Nova de Famalicão	685	0,281
Norte	Douro	São João da Pesqueira	615	6,411
Centro	Dão-Lafões	Viseu	598	1,972
Centro	Baixo Mondego	Figueira da Foz	571	0,355
Centro	Oeste	Torres Vedras	540	0,167

[i] This list considers only the shift with at least 250 new employees.

Norte	Tâmega	Resende	513	4,755
Norte	Douro	Peso da Régua	474	1,529
Alentejo	Baixo Alentejo	Beja	447	0,289
Centro	Baixo Vouga	Ílhavo	423	0,223
Centro	Oeste	Bombarral	413	3,182
Norte	Douro	Vila Flor	376	4,647
Centro	Dão-Lafões	São Pedro do Sul	368	2,108
Alentejo	Baixo Alentejo	Aljustrel	361	8,600
Lisboa	Grande Lisboa	Mafra	354	0,126
Centro	Baixo Vouga	Murtosa	337	1,523
Centro	Dão-Lafões	Tondela	336	0,680
Centro	Oeste	Peniche	313	0,223
Alentejo	Alto Alentejo	Elvas	310	0,397
Norte	Ave	Trofa	273	0,714
Norte	Douro	Alijó	272	0,435
Alentejo	Lezíria do Tejo	Alpiarça	262	0,461
Alentejo	Baixo Alentejo	Ferreira do Alentejo	258	0,305

Source: Elaboration of the authors on *Instituto Nacional de Estatística* (2012)

Table 2 offers an interesting perspective of what has been the municipalities able to "attract" more employees in Agri-food sector. We underline the results of Douro Sub-Region (4 municipalities), Baixo Alentejo, Oeste and Dão-Lafões (3 municipalities each) that have shown a high difference of workforce in Agri-food sector between the two years examined.

Oeiras, Odemira, Vila Nova de Famalicão, São João da Pesqueira, Viseu, Figueira da Foz, Torres Vedras, Resende scored a change of Agri-food employment ranged between 500-850 ca units, and looking at the low part of the total rank we find Lisbon in the last place and Porto fourth to last (see ATTACHMENT 1).

The municipality shift column indicates how the single municipality is performing respect to the Portugal shift in Agri-food employment[i].

Obviously these results don't tell us the reasons behind this alteration but could represent a good starting point to understand how the municipalities and the Sub-Region to keep in mind in future studies.

3.3. Clusters in Agri-food subsectors: where they are placed

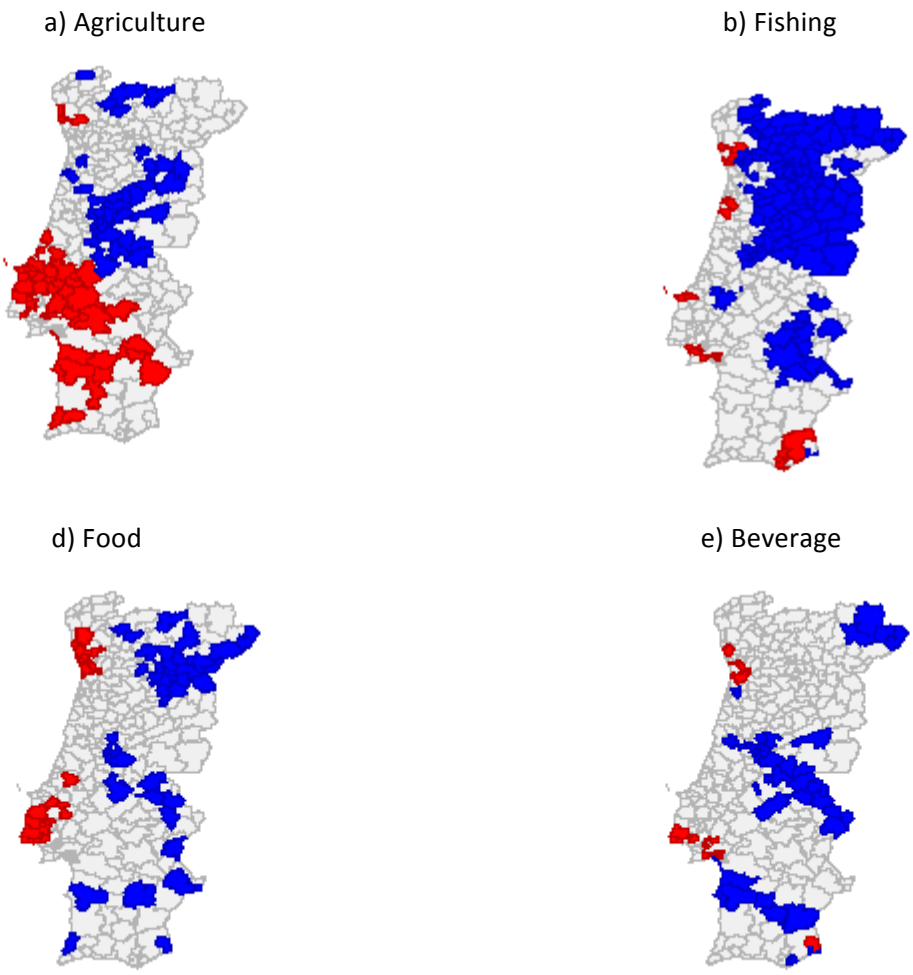
To find out where the singular industries are clustered we have applied the Local Getis-Ord Gi to describe the geographical concentration of agricultural, fishing, food and beverage subsectors.

The Figure 3 highlights with the red colour where each subsector (agriculture, fishing, food and beverage) tends to cluster (with high values) considering the number of employees.

Agriculture sector (the most relevant cluster) is manly gathered in Setubal, Lisboa, Santarém, Leiria, Evora and Beja district. Fishing sector in Faro, Setubal, Leiria, Aveiro, Porto. Food sector in Braga, Porto and Lisboa. Beverage sector in Porto, Lisboa, Setubal and Faro.

[i] The value of Municipality shift is under "0" when the Municipality is performing worse than Portugal (see Attachment 1).

FIGURE 4. THE FOUR CLUSTERS OF THE AGRI-FOOD SECTOR: A) AGRICULTURE, B) FISHING, C) FOOD, D) BEVERAGE



Source: Our elaboration on *Instituto Nacional de Estatística* (2012)

3.4. Spatial pattern of economic performance of Portugal municipalities in Agri-food sector

The objective of this section is to illustrate how the Agri-food sector contributes the Municipal development in economic term. We have calculated the ratio between Gross Value Added of Agri-food sector and total Gross Value Added of each municipality for the years 2004 and 2012 (as before, considering Agri-food sector composed by Agriculture, Fishing, Food and Beverage industries as a unique sector).

TABLE 3. THE BURDEN OF AGRI-FOOD GROSS VALUE ADDED ON THE TOTAL GROSS VALUE ADDED AT MUNICIPAL LEVEL (2012)

NUTS III	Region	Municipality	% GVA Agri-food on the total GVA
Médio Tejo	Centro	Ferreira do Zêzere	63%
Lezíria do Tejo	Alentejo	Alpiarça	61%
Douro	Norte	Sabrosa	56%
Baixo Alentejo	Alentejo	Vidigueira	55%
Baixo Alentejo	Alentejo	Ferreira do Alentejo	53%
Alentejo Central	Alentejo	Redondo	53%
Douro	Norte	São João da Pesqueira	51%
Alentejo Central	Alentejo	Alandroal	50%
Douro	Norte	Vila Flor	50%
Alto Alentejo	Alentejo	Avis	48%
Alentejo Central	Alentejo	Reguengos de Monsaraz	44%
Douro	Norte	Alijó	43%
Lezíria do Tejo	Alentejo	Golegã	43%
Alentejo Central	Alentejo	Sousel	41%
Alentejo Central	Alentejo	Portel	39%
Alentejo Litoral	Alentejo	Odemira	39%
Lezíria do Tejo	Alentejo	Rio Maior	37%
Oeste	Centro	Lourinhã	37%
Alto Alentejo	Alentejo	Mora	35%
Lezíria do Tejo	Alentejo	Coruche	34%
Douro	Norte	Mesão Frio	33%
Alentejo Central	Alentejo	Arraiolos	32%
Baixo Alentejo	Alentejo	Cuba	32%
Lezíria do Tejo	Alentejo	Almeirim	31%
Baixo Alentejo	Alentejo	Serpa	29%
Oeste	Centro	Peniche	28%
Oeste	Centro	Cadaval	28%
Beira Interior Norte	Centro	Figueira de Castelo Rodrigo	26%
Alentejo Central	Alentejo	Estremoz	26%
Lezíria do Tejo	Alentejo	Cartaxo	26%
Douro	Norte	Peso da Régua	26%
Baixo Vouga	Centro	Ílhavo	25%
Lezíria do Tejo	Alentejo	Azambuja	25%
Alto Trás-os-Montes	Norte	Murça	24%
Algarve	Algarve	Monchique	24%
Douro	Norte	Vila Nova de Foz Côa	23%
Alentejo Central	Alentejo	Viana do Alentejo	22%
Algarve	Algarve	Alcoutim	22%
Alto Alentejo	Alentejo	Marvão	22%
Dão-Lafões	Centro	Aguiar da Beira	22%
Douro	Norte	Freixo de Espada à Cinta	22%

Algarve	Algarve	Olhão	22%
Baixo Alentejo	Alentejo	Ourique	21%
Lezíria do Tejo	Alentejo	Salvaterra de Magos	21%
Baixo Mondego	Centro	Soure	20%
Douro	Norte	Lamego	20%
Alto Alentejo	Alentejo	Arronches	20%

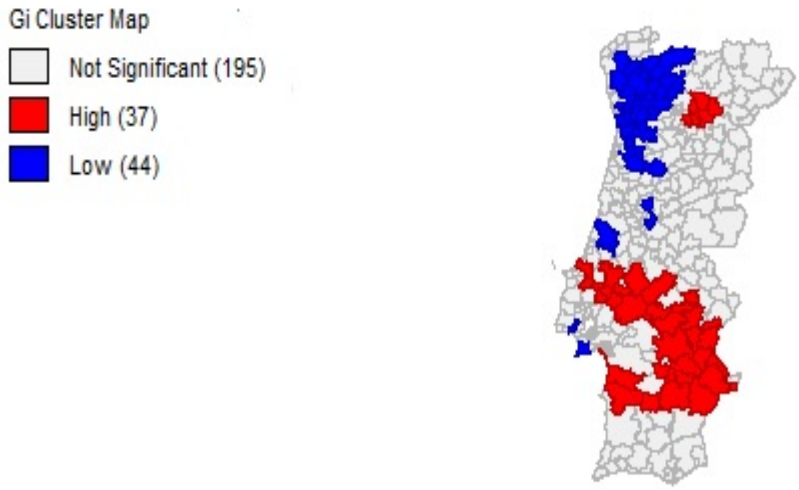
Source: our elaboration on *Instituto Nacional de Estatística* (2012)

Table 3 shows the value of the ratio between Agri-food Gross Value Added on the total Gross Value Added with the lower threshold of 20%.

The results (calculated by 2012) underline a high "Agri-food" dependence regarding economic growth of Douro, Alentejo Central and Lezíria do Tejo respectively with 9,8 and eight municipalities included in table 3.

To visualize the spatial pattern of Agri-food Gross Value Added we had used again the Local Getis-Ord Gi, obtaining the following map:

FIGURE 5. SPATIAL AGGLOMERATIONS OF THE BURDEN OF AGRI-FOOD GROSS VALUE ADDED ON THE TOTAL GROSS VALUE ADDED AT MUNICIPAL LEVEL (2012)



Source: Our elaboration on *Instituto Nacional de Estatística* (2012)

Portugal shows 37 hot spots and 44 cold spots in term of burden of Agri-food sector Gross Value Added respect to the total.

The hot spots are situated in the districts of Setubal, Beja, Evora, Portalegre, Santarém, Leiria and Vila Real. The cold spots are mainly placed in the northwest part, in Braga, Porto, Viseu and the west part of Vila Real.

Bearing in mind the comparison year of 2004 used in the analysis of employment in Agri-food sector we have reported the municipalities that had considerably augmented their Agri-food Gross Value Added weight from 2004 to 2012.

We notice the important performances of Vila Flor and São João da Pesqueira (Douro Sub-Region) that have registered percentage of 43 and 38, boosting their Agri-food Gross Value Added to 50% of the total

TABLE 3. THE BURDEN OF AGRI-FOOD GROSS VALUE ADDED ON THE TOTAL GROSS VALUE ADDED AT MUNICIPAL LEVEL-TOP LIST OF HIGHER INTENSIFICATION FROM 2004

NUTS III	Region	Municipality	% GVA Agri-food on the total	% of increase from 2004
Douro	Norte	Vila Flor	50%	43%
Douro	Norte	São João da Pesqueira	51%	38%
Médio Tejo	Centro	Ferreira do Zêzere	63%	33%
Baixo Alentejo	Alentejo	Ferreira do Alentejo	53%	29%
Baixo Alentejo	Alentejo	Vidigueira	55%	26%
Lezíria do Tejo	Alentejo	Alpiarça	61%	25%
Douro	Norte	Peso da Régua	26%	21%
Lezíria do Tejo	Alentejo	Almeirim	31%	18%
Douro	Norte	Sabrosa	56%	17%

Source: our elaboration on Instituto Nacional de Estatística (2012)

4. CONCLUSION

In the present work, we have shaped the Agri-food industry structure into Portugal, taking in account its number of employees and Gross Value Added at a municipal level. We have integrated these data with indexes of performance (over a period and across municipal border of Portugal) finding out interesting outcomes in term of clustered areas.

The comparison between 2004 and 2012 indicates that employees and ratio of Agri-food GVA on in Agri-food sector are concentrated more or less in the same areas (considering all Portugal, see ATTACHMENT 2).

However some sub-regions are characterized by remarkable improvements during the last eight years such as the Douro, Baixo Alentejo and Lezíria do Tejo regarding GVA and Grande Lisboa, Alentejo Litoral, Ave, Douro, Dão-Lafões concerning employment.

There are also resounding cases such as like Lisboa and Sintra (Grande Lisboa), where the number of employees in Agri-food had reduced considerably (see ATTACHMENT 1), a sign of transformation of Agri-food structure.

Mapping the geographical structure is a first approach to recognize cases of local development based on Agri-food business and identify where cluster patterns can stimulate the analysis of excellence, an effort that requires a multidisciplinary perspective and further research.

We confirm that geographical proximity matters. We are facing in Portugal new scenarios in term of policy making in the attempt to overcome regional imbalances and new boundaries or extended focus are required. All in one, we advocate that building measures better tailored at a local level able to foster further local development are still required within the enlarged frame of the Portuguese regional public policy.

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ATTACHEMENT 1

The Municipal shift share analysis in Agri-food sector in 2004-2012

Region	NUTS III	Municipality	diff. 12-04	Municipal shift
Lisboa	Grande Lisboa	Oeiras	860	0,267
Alentejo	Alentejo Litoral	Odemira	845	0,536
Norte	Ave	Vila Nova de Famalicão	685	0,281
Norte	Douro	São João da Pesqueira	615	6,411
Centro	Dão-Lafões	Viseu	598	1,972
Centro	Baixo Mondego	Figueira da Foz	571	0,355
Centro	Oeste	Torres Vedras	540	0,167
Norte	Tâmega	Resende	513	4,755
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Centro	Oeste	Bombarral	413	3,182
Norte	Douro	Vila Flor	376	4,647
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Centro	Oeste	Peniche	313	0,223
Alentejo	Alto Alentejo	Elvas	310	0,397
Norte	Ave	Trofa	273	0,714
Norte	Douro	Alijó	272	0,435
Alentejo	Lezíria do Tejo	Alpiarça	262	0,461
Alentejo	Baixo Alentejo	Ferreira do Alentejo	258	0,305
Centro	Dão-Lafões	Oliveira de Frades	248	0,594
Centro	Oeste	Lourinhã	238	0,131
Norte	Grande Porto	Maia	224	0,134
Centro	Serra da Estrela	Seia	210	0,416
Centro	Dão-Lafões	Castro Daire	202	0,005
Centro	Médio Tejo	Torres Novas	200	0,370
Alentejo	Lezíria do Tejo	Azambuja	198	0,181
Centro	Baixo Mondego	Mira	197	0,617
Lisboa	Península de Setúbal	Moita	189	0,297
Centro	Beira Interior Norte	Figueira de Castelo Rodrigo	188	1,598
Norte	Tâmega	Felgueiras	187	0,695
Centro	Cova da Beira	Fundão	177	0,273
Alentejo	Baixo Alentejo	Moura	177	0,216
Norte	Minho-Lima	Ponte de Lima	175	0,362
Alentejo	Baixo Alentejo	Almodôvar	165	1,623
Centro	Oeste	Arruda dos Vinhos	164	1,277
Centro	Beira Interior Norte	Pinhel	160	1,182
Alentejo	Lezíria do Tejo	Salvaterra de Magos	155	0,243

Centro	Dão-Lafões	Carregal do Sal	154	1,796
Centro	Beira Interior Sul	Castelo Branco	145	0,252
Centro	Oeste	Óbidos	141	0,366
Alentejo	Lezíria do Tejo	Rio Maior	140	0,080
Alentejo	Baixo Alentejo	Vidigueira	134	0,369
Centro	Médio Tejo	Alcanena	133	1,483
Centro	Dão-Lafões	Aguiar da Beira	132	1,864
Norte	Ave	Santo Tirso	128	0,373
Norte	Ave	Guimarães	127	0,082
Centro	Pinhal Litoral	Batalha	124	1,339
Norte	Grande Porto	Póvoa de Varzim	120	0,110
Centro	Baixo Mondego	Soure	118	0,527
Norte	Douro	Torre de Moncorvo	116	2,005
Norte	Douro	Moimenta da Beira	115	0,678
Centro	Dão-Lafões	Mangualde	110	1,935
Norte	Alto Trás-os-Montes	Macedo de Cavaleiros	110	0,508
Centro	Serra da Estrela	Gouveia	108	1,233
Norte	Douro	Vila Real	107	0,183
Centro	Beira Interior Norte	Sabugal	106	0,853
Centro	Dão-Lafões	Vouzela	105	0,472
Centro	Baixo Vouga	Ovar	101	0,150
Alentejo	Alentejo Central	Viana do Alentejo	98	0,431
Alentejo	Alentejo Litoral	Santiago do Cacém	98	0,104
Norte	Alto Trás-os-Montes	Miranda do Douro	93	0,761
Centro	Beira Interior Norte	Guarda	91	0,221
Alentejo	Alto Alentejo	Crato	88	1,425
Norte	Ave	Póvoa de Lanhoso	83	0,680
Centro	Pinhal Interior Norte	Tábua	82	0,626
Alentejo	Alentejo Central	Portel	82	0,318
Algarve	Algarve	Silves	77	0,101
Norte	Grande Porto	Gondomar	77	0,095
Centro	Beira Interior Norte	Celorico da Beira	76	0,684
Centro	Dão-Lafões	Sátão	72	0,940
Centro	Médio Tejo	Ferreira do Zêzere	72	0,142
Norte	Cávado	Esposende	71	0,155
Norte	Tâmega	Ribeira de Pena	70	2,698
Norte	Douro	Penedono	70	0,005
Alentejo	Alto Alentejo	Avis	68	0,202
Alentejo	Lezíria do Tejo	Golegã	67	0,210
Centro	Dão-Lafões	Nelas	63	0,960
Alentejo	Alentejo Central	Arraiolos	63	0,152
Norte	Alto Trás-os-Montes	Chaves	63	0,139
Centro	Baixo Mondego	Montemor-o-Velho	63	0,085
Norte	Douro	Sabrosa	62	0,160
Norte	Douro	Freixo de Espada à Cinta	61	0,698

Alentejo	Lezíria do Tejo	Almeirim	59	0,050
Centro	Dão-Lafões	Mortágua	58	0,005
Norte	Cávado	Amares	57	0,247
Norte	Alto Trás-os-Montes	Murça	56	0,472
Alentejo	Alto Alentejo	Marvão	55	0,660
Centro	Pinhal Interior Norte	Arganil	55	0,331
Centro	Pinhal Interior Norte	Lousã	54	0,437
Algarve	Algarve	Monchique	54	0,378
Alentejo	Baixo Alentejo	Serpa	53	0,062
Alentejo	Lezíria do Tejo	Santarém	48	0,024
Norte	Alto Trás-os-Montes	Vimioso	46	0,759
Norte	Ave	Vizela	45	1,329
Norte	Alto Trás-os-Montes	Mirandela	41	0,065
Centro	Dão-Lafões	Penalva do Castelo	36	0,543
Norte	Alto Trás-os-Montes	Vinhais	36	0,305
Centro	Beira Interior Norte	Trancoso	36	0,239
Norte	Alto Trás-os-Montes	Vila Pouca de Aguiar	35	0,210
Norte	Grande Porto	Valongo	34	0,056
Alentejo	Baixo Alentejo	Ourique	33	0,127
Centro	Baixo Vouga	Aveiro	33	0,032
Norte	Tâmega	Lousada	32	0,090
Lisboa	Península de Setúbal	Sesimbra	32	0,040
Norte	Tâmega	Penafiel	31	0,043
Norte	Tâmega	Baião	29	0,176
Norte	Ave	Fafe	28	0,131
Norte	Minho-Lima	Monção	28	0,122
Norte	Minho-Lima	Caminha	28	0,091
Centro	Baixo Vouga	Sever do Vouga	27	0,201
Alentejo	Alentejo Litoral	Grândola	27	0,085
Centro	Beira Interior Norte	Mêda	26	0,547
Algarve	Algarve	Lagoa	26	0,144
Centro	Pinhal Litoral	Leiria	22	0,014
Norte	Ave	Vieira do Minho	21	0,661
Centro	Oeste	Cadaval	18	0,029
Norte	Minho-Lima	Melgaço	17	0,196
Centro	Pinhal Interior Norte	Ansião	16	0,128
Centro	Baixo Mondego	Condeixa-a-Nova	15	0,061
Centro	Baixo Vouga	Estarreja	15	0,037
Norte	Tâmega	Marco de Canaveses	15	0,032
Centro	Pinhal Interior Norte	Vila Nova de Poiares	14	0,217
Norte	Tâmega	Celorico de Basto	14	0,101
Centro	Médio Tejo	Entroncamento	13	0,226
Norte	Douro	Sernancelhe	13	0,145
Alentejo	Baixo Alentejo	Cuba	13	0,080
Alentejo	Alto Alentejo	Nisa	13	0,056

Norte	Alto Trás-os-Montes	Bragança	13	0,035
Alentejo	Alentejo Central	Alandroal	13	0,032
Lisboa	Península de Setúbal	Almada	13	0,030
Centro	Baixo Mondego	Penacova	11	0,112
Algarve	Algarve	Alcoutim	11	0,107
Centro	Beira Interior Norte	Manteigas	10	0,720
Centro	Beira Interior Norte	Almeida	9	0,434
Norte	Cávado	Terras de Bouro	9	0,189
Centro	Médio Tejo	Vila Nova da Barquinha	8	0,227
Centro	Baixo Vouga	Albergaria-a-Velha	8	0,027
Norte	Alto Trás-os-Montes	Mogadouro	7	0,039
Centro	Beira Interior Sul	Vila Velha de Ródão	6	0,076
Centro	Pinhal Interior Sul	Proença-a-Nova	3	0,037
Norte	Tâmega	Mondim de Basto	3	0,032
Algarve	Algarve	Portimão	3	0,012
Centro	Pinhal Interior Sul	Sertã	2	0,034
Centro	Pinhal Interior Norte	Penela	2	0,019
Norte	Douro	Mesão Frio	2	0,017
Centro	Pinhal Interior Sul	Oleiros	1	0,035
Norte	Alto Trás-os-Montes	Alfândega da Fé	1	0,012
Norte	Minho-Lima	Arcos de Valdevez	1	0,012
Centro	Pinhal Interior Norte	Miranda do Corvo	1	0,010
Centro	Pinhal Interior Norte	Pampilhosa da Serra	0	0,005
Centro	Pinhal Interior Norte	Pedrógão Grande	-1	-0,007
Centro	Baixo Vouga	Vagos	-2	-0,002
Algarve	Algarve	Aljezur	-2	-0,011
Centro	Pinhal Interior Norte	Figueiró dos Vinhos	-3	-0,050
Centro	Pinhal Interior Norte	Castanheira de Pêra	-3	-0,995
Alentejo	Alto Alentejo	Monforte	-4	-0,016
Centro	Serra da Estrela	Fornos de Algodres	-4	-0,041
Alentejo	Alto Alentejo	Castelo de Vide	-4	-0,044
Norte	Cávado	Barcelos	-6	0,002
Centro	Médio Tejo	Ourém	-6	-0,008
Norte	Cávado	Vila Verde	-9	-0,015
Norte	Entre Douro e Vouga	Arouca	-10	-0,034
Norte	Douro	Lamego	-11	-0,009
Algarve	Algarve	Castro Marim	-12	-0,087
Norte	Minho-Lima	Ponte da Barca	-12	-0,105
Norte	Tâmega	Castelo de Paiva	-12	-0,108
Centro	Beira Interior Sul	Penamacor	-13	-0,088
Centro	Pinhal Interior Norte	Góis	-14	-0,328
Norte	Alto Trás-os-Montes	Valpaços	-15	-0,052
Alentejo	Alto Alentejo	Fronteira	-15	-0,550
Norte	Entre Douro e Vouga	Vale de Cambra	-16	-0,044
Centro	Pinhal Interior Sul	Vila de Rei	-17	-0,176

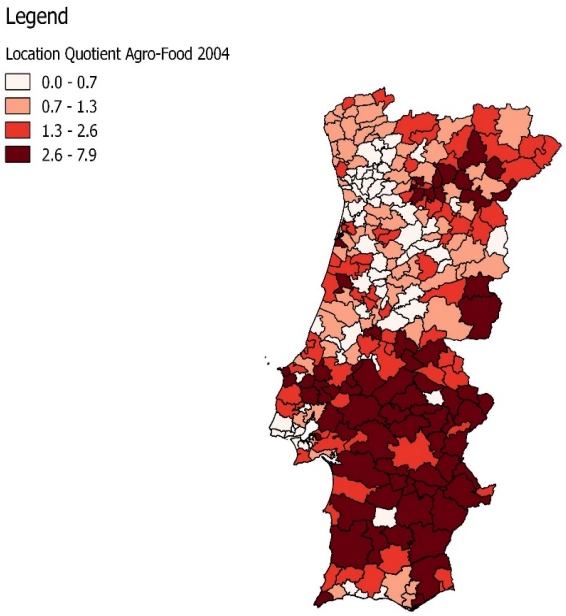
Norte	Grande Porto	Espinho	-18	-0,068
Norte	Minho-Lima	Paredes de Coura	-20	-0,242
Alentejo	Alto Alentejo	Arronches	-21	-0,136
Alentejo	Alentejo Central	Évora	-22	-0,009
Centro	Baixo Mondego	Coimbra	-22	-0,010
Centro	Pinhal Interior Norte	Alvaiázere	-24	-0,184
Algarve	Algarve	Tavira	-27	-0,032
Alentejo	Baixo Alentejo	Mértola	-27	-0,063
Algarve	Algarve	Albufeira	-29	-0,047
Centro	Pinhal Litoral	Marinha Grande	-30	-0,212
Norte	Tâmega	Cabeceiras de Basto	-31	-0,182
Alentejo	Alentejo Central	Vendas Novas	-33	-0,112
Algarve	Algarve	São Brás de Alportel	-33	-0,303
Centro	Dão-Lafões	Santa Comba Dão	-36	-0,325
Norte	Minho-Lima	Valença	-39	-0,108
Centro	Médio Tejo	Constância	-39	-0,923
Norte	Minho-Lima	Vila Nova de Cerveira	-40	-0,141
Alentejo	Baixo Alentejo	Barrancos	-40	-0,995
Alentejo	Alentejo Central	Redondo	-41	-0,065
Centro	Pinhal Interior Sul	Mação	-41	-0,162
Centro	Médio Tejo	Sardoal	-41	-0,589
Algarve	Algarve	Faro	-42	-0,029
Algarve	Algarve	Vila Real de Santo António	-44	-0,109
Norte	Entre Douro e Vouga	São João da Madeira	-44	-0,180
Centro	Dão-Lafões	Vila Nova de Paiva	-45	-0,995
Centro	Oeste	Sobral de Monte Agraço	-51	-0,155
Centro	Pinhal Interior Norte	Oliveira do Hospital	-52	-0,119
Norte	Tâmega	Cinfães	-52	-0,536
Alentejo	Lezíria do Tejo	Chamusca	-54	-0,133
Alentejo	Alto Alentejo	Mora	-58	-0,156
Norte	Tâmega	Paços de Ferreira	-59	-0,174
Alentejo	Alto Alentejo	Gavião	-61	-0,599
Alentejo	Baixo Alentejo	Castro Verde	-65	-0,208
Norte	Tâmega	Amarante	-68	-0,107
Norte	Alto Trás-os-Montes	Boticas	-68	-0,795
Lisboa	Grande Lisboa	Odivelas	-69	-0,099
Norte	Tâmega	Paredes	-69	-0,120
Lisboa	Península de Setúbal	Alcochete	-70	-0,113
Centro	Oeste	Nazaré	-70	-0,174
Alentejo	Baixo Alentejo	Alvito	-71	-0,995
Centro	Oeste	Alcobaça	-73	-0,032
Alentejo	Alentejo Central	Montemor-o-Novo	-73	-0,067
Lisboa	Grande Lisboa	Cascais	-77	-0,058
Centro	Cova da Beira	Belmonte	-77	-0,695
Algarve	Algarve	Lagos	-90	-0,229

Alentejo	Alentejo Central	Mourão	-90	-0,828
Alentejo	Alentejo Central	Estremoz	-97	-0,088
Alentejo	Alto Alentejo	Portalegre	-100	-0,152
Algarve	Algarve	Vila do Bispo	-100	-0,385
Alentejo	Lezíria do Tejo	Coruche	-102	-0,071
Norte	Entre Douro e Vouga	Santa Maria da Feira	-104	-0,104
Centro	Baixo Vouga	Oliveira do Bairro	-108	-0,296
Lisboa	Península de Setúbal	Seixal	-110	-0,139
Centro	Baixo Mondego	Cantanhede	-112	-0,148
Alentejo	Lezíria do Tejo	Cartaxo	-116	-0,120
Norte	Douro	Tabuaço	-119	-0,553
Centro	Cova da Beira	Covilhã	-121	-0,205
Norte	Grande Porto	Matosinhos	-129	-0,034
Alentejo	Alentejo Central	Sousel	-129	-0,194
Norte	Cávado	Braga	-132	-0,129
Norte	Minho-Lima	Viana do Castelo	-135	-0,113
Norte	Grande Porto	Vila do Conde	-136	-0,040
Alentejo	Alto Alentejo	Campo Maior	-140	-0,210
Norte	Alto Trás-os-Montes	Montalegre	-149	-0,657
Alentejo	Alentejo Central	Vila Viçosa	-161	-0,820
Alentejo	Alentejo Litoral	Alcácer do Sal	-162	-0,158
Lisboa	Península de Setúbal	Barreiro	-175	-0,322
Alentejo	Alto Alentejo	Alter do Chão	-183	-0,905
Norte	Douro	Armamar	-187	-0,534
Centro	Médio Tejo	Abrantes	-188	-0,247
Centro	Baixo Vouga	Mealhada	-195	-0,309
Alentejo	Alentejo Central	Reguengos de Monsaraz	-196	-0,156
Alentejo	Alentejo Litoral	Sines	-201	-0,385
Norte	Douro	Tarouca	-201	-0,695
Lisboa	Península de Setúbal	Montijo	-205	-0,090
Centro	Oeste	Caldas da Rainha	-211	-0,155
Lisboa	Grande Lisboa	Vila Franca de Xira	-214	-0,132
Centro	Baixo Vouga	Águeda	-216	-0,439
Norte	Douro	Carrazeda de Ansiães	-224	-0,749
Centro	Beira Interior Sul	Idanha-a-Nova	-245	-0,337
Lisboa	Península de Setúbal	Setúbal	-257	-0,162
Norte	Douro	Vila Nova de Foz Côa	-263	-0,704
Lisboa	Grande Lisboa	Amadora	-275	-0,253
Alentejo	Alto Alentejo	Ponte de Sor	-276	-0,367
Algarve	Algarve	Loulé	-285	-0,231
Norte	Entre Douro e Vouga	Oliveira de Azeméis	-305	-0,278
Centro	Pinhal Litoral	Pombal	-307	-0,280
Norte	Douro	Santa Marta de Penaguião	-320	-0,712
Norte	Grande Porto	Vila Nova de Gaia	-324	-0,070
Centro	Baixo Vouga	Anadia	-331	-0,318

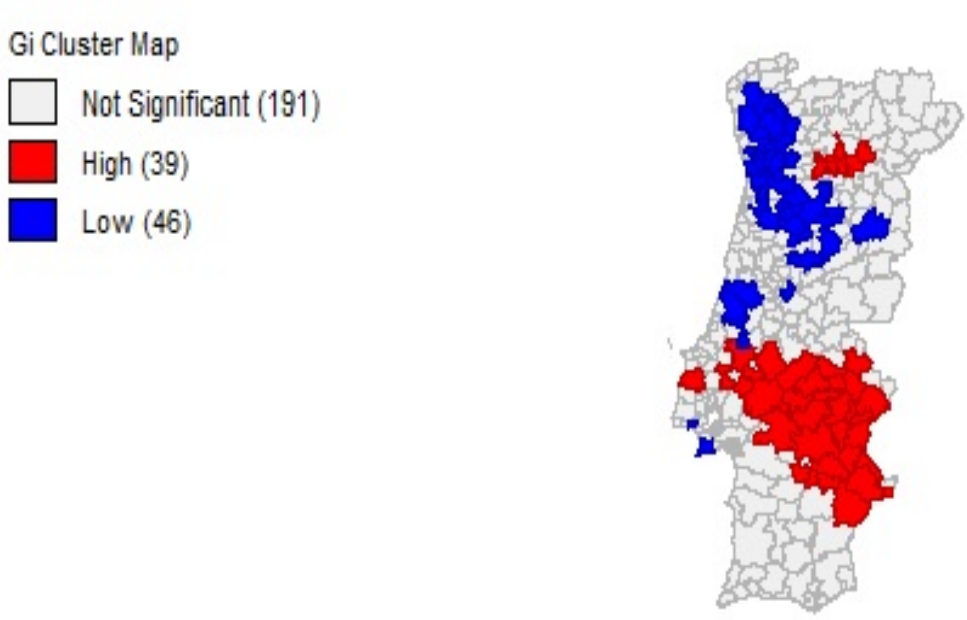
Centro	Oeste	Alenquer	-363	-0,151
Lisboa	Península de Setúbal	Palmela	-408	-0,187
Centro	Pinhal Litoral	Porto de Mós	-421	-0,820
Lisboa	Grande Lisboa	Loures	-512	-0,194
Alentejo	Alentejo Central	Borba	-523	-0,811
Centro	Médio Tejo	Tomar	-533	-0,505
Algarve	Algarve	Olhão	-546	-0,230
Norte	Grande Porto	Porto	-669	-0,153
Alentejo	Lezíria do Tejo	Benavente	-753	-0,448
Lisboa	Grande Lisboa	Sintra	-848	-0,221
Lisboa	Grande Lisboa	Lisboa	-1811	-0,248

ATTACHEMENT 2

Location Quotient calculated on INE database (2004)



Spatial agglomerations of the burden of Agri-food Gross Value Added on the total Gross Value Added at municipal level (2004)



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Turismo e património gastronómico: A valorização turística de um cabaz de doçaria algarvia

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ABSTRACT

In the present article, it's tried to demonstrate, in the case of one of the most important portuguese regions in the tourism sector, the Algarve region, that gastronomy, concretely, the regional sweets, constitutes a cultural heritage that trough the association of the main promoted coastal attractions, such as Climate, Light and Sea, can be a factor of enrichment of tourist experience on one hand, while it can contribute, on another, to the creation of value and territorial cohesion through the stimulus of local production and its communion with the regional tourism offer. In this line of thought, it's was applied a questionnaire in order to know the degree of preference and willingness to pay of tourists visiting the Algarve region to taste a basket of regional sweets to be offered in hotels and other accommodation facilities, located on the Algarve coastal landscape, where the main motivation of the tourist is beach recreation. Accordingly, the results infer the greater or lesser receptivity of the tourists who visit the Algarve region to see this experience of gifting regional sweets to tourists applied and implemented in more tourist accommodations, aiming, creatively, to enhance the regional offer of tourism services.

Keywords: Tourism, Gastronomy, Regional Sweets, Promotion, Territorial cohesion
JEL classification: : Z32, Z38, R58

RESUMO

Pelo presente artigo, intenta-se demonstrar, no caso de umas das mais destacadas regiões portuguesas no sector do turismo, Algarve, que a gastronomia, concretamente, a doçaria regional, constitui um património cultural que, se associado à experiência turística definida mediante os principais e litorais activos, Clima, Luz e Mar, pode vir a constituir-se como factor de enriquecimento da mesma, por um lado, ao passo que, por outro, pode contribuir para a criação de valor e coesão territorial através da redinamização da produção local e sua comunhão com a actual apropriação turística do território regional. Nesta linha de pensamento, urgiu saber qual o grau de gosto preferencial e disposição a pagar dos turistas que visitam a região do Algarve a desfrutar e degustar de doçaria regional ofertada em empreendimentos turísticos colaborantes, situados no litoral algarvio, onde a principal motivação turística é o recreio e lazer balnear. Os resultados inferem a maior ou menor receptividade dos turistas que visitam a região do Algarve a verem esta experiência aplicada e implementada nos demais alojamentos turísticos por forma a enaltecer, criativamente, a oferta de serviços de turismo na região.

Palavras-chave: Turismo, Gastronomia, Doçaria, Promoção, Coesão territorial
Classificação JEL: Z32, Z38, R58

1. INTRODUÇÃO

Tal como em muitas regiões do clima mediterrânico, a principal aposta no usufruto e promoção turística faz-se no produto "sol e mar". Em Portugal, a recentemente delineada Estratégia Turismo 2027 – Liderar o Turismo do Futuro (TP, 2017) pelo Turismo de Portugal, I.P., do Ministério da Economia, define o Clima, Luz, Mar, Água, História e Cultura como activos turísticos diferenciadores, sinalizando Gastronomia e Vinhos, enquanto activo qualificador da experiência turística no território português.

Os primeiros activos carrilam numa estratégia de sustentabilidade e competitividade do destino Portugal, na medida em que se afirmam e promovem como atributos de base e substância para a oferta turística nacional, arrogando-se aos mesmos um carácter diferenciador pela sua endogenia, não transacionabilidade, e geração de fluxos, ou seja, caracterizam, intrínseca e distintivamente, este destino-território, não são transferíveis ou imitáveis noutro local, e fomentam a procura, respectivamente (TP, 2017).

Já um activo qualificador, neste caso, Gastronomia e Vinhos, consolida, por seu turno, a experiência turística e acrescenta valor à oferta dos territórios turísticos, robustecendo a competitividade do destino, por um lado, mas, também e por outro, a resiliência das regiões que o suportam a desafios actuais ou potenciais, como as alterações climáticas, flutuações de atratividade turística, entre demais.

Neste âmbito, a região do Algarve, sul de Portugal, enquanto destino primeiro de Clima, Luz e Mar, poderia enriquecer a experiência turística dos seus visitantes por via da diversificação consolidativa da promoção de activos, de modo a enaltecer e aventar o seu rico património gastronómico, reconhecendo-o na qualidade de mais-valia no tocante à competitividade e resiliência regional.

Vários foram os estudos empreendidos nesta temática, salientando-se a resenha acerca das dimensões da Dieta Mediterrânica na qualidade de Património Cultural da Humanidade (Freitas et al., 2015), a elencagem de recursos da região do Algarve passíveis de firmar as principais temáticas culturais a valorizar para fins turísticos (Mendes, Henriques & Guerreiro, 2015), o diagnóstico das presentes práticas de valorização do património gastronómico algarvio no seio dos agentes regionais de restauração (Henriques & Custódio, 2010) e a análise das políticas públicas e privadas de valorização turística da doçaria regional algarvia (Domingos & Henriques, 2015).

Ora, neste artigo, o enfoque será na conceptualização de como pode e deve a identidade regional, no seu todo e não pela mera adição das partes, constituir um predicado, simultaneamente, para o

usufruto turístico e para a produção regional, e na discussão dos resultados emanados da concretização de uma experiência de carácter qualitativo e casual de auscultação das preferências pela doçaria regional dos dois maiores segmentos de turistas que visitam a região do Algarve, nomeadamente visitantes provenientes de Portugal e do Reino Unido. Este estudo de preferências declaradas cumpriu-se através da apresentação e degustação de cabazes de produtos regionais ofertados em alojamentos turísticos, localizados no centro-litoral algarvio, cuja a primeira motivação de visitação é o activo turístico *Clima, Luz* e *Mar*, comummente denominando de *Sol e Mar*, objectivando-se a coadjuvação e elucidação de conhecimento instrutivo na gestão e promoção, pública e privada, da autêntica produção regional do Algarve com um propósito turístico, por um lado, e com um ensejo de coesão e respectivo enfraquecimento das assimetrias entre as várias unidades territoriais e paisagísticas da região (CCDRAlg, 2016), por outro.

2. Políticas de uso e valorização do Património Gastronómico: O caso da doçaria da região do Algarve

A região do Algarve é abrangida por três unidades de paisagem fundamentais. A norte, denota-se a *Serra* xistosa, onde predominam bosques e matagais esclerófilos, essenciais à pastorícia, marcando a transição para a interioridade alentejana (Cancela d'Abreu et al., 2014; Pessoa, 2017). Entre a serra e o litoral, encontra-se o *Barrocal* calcário, que suporta os pomares de sequeiro de amendoeiras, figueiras, alfarrobeiras e oliveiras (Pessoa, 2017). A sul, a paisagem litoral formada de dunas, arribas e sapais miscigenou-se, a partir dos anos 60, com um acentuado crescimento urbano-turístico e um paisagismo a roçar um exotismo pouco qualificador, sendo hoje a imagem de marca do Algarve, ao passo que o Barrocal passou a ser pontuado e pautado pela intensificação de pomares de regadio, e a Serra se consignou a um decadente e bucólico, porém, pouco augusto, abandono (Cancela d'Abreu et al., 2014; Pessoa, 2017).

Actualmente, assume-se que o turismo de qualidade deve reger-se pelo aproveitamento, preservação e valorização da especificidade de qualquer região. Urge, portanto, a grande transição paradigmática da primeira modernidade e, como tal, da primeira ruralidade, assente na anómica expansão urbana supermoderna de não-lugares (Augé, 2012) e no binómio cidade-campo, para um ciclo eco-rural nesta modernidade reflexiva beckiana, onde, pela assunção do cosmopolitismo do risco (Beck, 2015), poderá emergir a segunda ruralidade, em que a *Paisagem Global* (Telles, 2011), a eco-região, a cidade-região possibilitará a dissolução do modelo binomial anterior pela sua fusão, integração e diversificação com vista à criação de novas funcionalidades e territorialidades e, tal qual, novas oportunidades (Covas & Covas, 2012).

Assim, a associação entre a tradição e a inovação poderia constituir uma valerosa contribuição para a sustentabilidade da região do Algarve. A *Dieta Mediterrânica* pode cumprir-se, enquanto elo entre urbano-turístico e o rural (Freitas et al., 2015), sendo que Mendes, Henriques & Guerreiro (2015), no seu inquérito a autarquias, empresas e associações culturais, identificaram mais de 1500 recursos culturais da região do Algarve passíveis de serem valorizados turisticamente, pelo que a temática *Dieta Mediterrânica*, por meio do uso de produtos alimentares locais e promoção da cozinha da terra e do mar, é assumida, enquanto nuclear no desenvolvimento do *Turismo Cultural* na região.

Note-se, neste âmbito, que cerca de 60% dos turistas apontam o património e a oferta cultural algarvia como critério importante na decisão de escolha da região para seu destino de férias (Silva et al., 2007).

Também Valle et al. concluíram no seu estudo (2011), baseado em inquérito a turistas que visitam a região, que 87% dos mesmos procuram ter outras experiências para lá do sol e praia, pelo que 78% referiram a gastronomia como uma das principais atracções turísticas do Algarve (Cit. Mendes, Henriques & Guerreiro, 2015).

Posto isto, a valorização turística do património gastronómico algarvio poderia ser estabelecida, na qualidade de activo na afirmação do turismo cultural, na sua acepção mais ortodoxa, isto é, um tipo de turismo que incide sobre a "*cultura e os ambientes culturais, incluindo paisagens de destino, valores e estilos de vida, património, artes visuais e perfomartivas, indústrias, tradições e actividades de lazer da população ou comunidade local*" (Cit. Mendes, Henriques & Guerreiro, 2015, p. 34), ou, numa óptica inovadora assente no *Turismo Criativo*, onde "*os visitantes têm a oportunidade de desenvolver o seu potencial criativo através da participação activa em experiências de aprendizagem que são características do destino de férias onde são levadas a cabo*" (Gonçalves, 2008, pp. 12-13).

Assim, desvela-se a potencialidade de diversificação consubstanciada do destino turístico Algarve por via da disponibilização de uma linha cultural de produtos e serviços estruturados que possibilite o desfrute sensório-cultural do que é produzido regionalmente, tal como a carne caprina, o pescado, o marisco, a amêndoa, o figo, a alfarroba, a doçaria, o medronho, os vinhos, os licores, o mel, a azeitona, o azeite, as ervas aromáticas, as flores comestíveis, os produtos micológicos, os queijos, a cestaria, a olaria e a cortiça, entre demais, e/ou a participação criativa do turista nas suas artes respectivas, nomeadamente o pastoreio, a pesca, o varejo, a apanha, a culinária, a pisa, a queijaria, a cestaria, a olaria, a tirada, entre outros (Covas e Covas, 2015).

No entanto, no que concerne à gastronomia tradicional algarvia e à sua valorização, um estudo, realizado por análise de ementas e por inquérito a gestores e proprietários de restaurantes situados em marinas e portos de recreio, demonstrou que os turistas da região não estão familiarizados com a gastronomia regional, apresentando um desconhecimento face à existência, designação e confecção dos pratos tradicionais (12,4% dos inquiridos), um desinteresse em experimentar (9,4%) e uma desconfiança face a sugestões (7,3%), o que leva alguns agentes de restauração a ir de encontro ao intento de adaptação aos gostos dos clientes, servindo pratos de anómica gastronomia internacional (Henriques & Custódio, 2010). Foi identificado pelos mesmos um segmento turístico neofóbico, isto é, pouco interessado em experimentar pratos diferentes e com ingredientes desconhecidos. Por sua vez, outro segmento com mais expressão, até, e com assinalável potencial de expansão, é o neofílico, ou seja, aquele que está interessado em conhecer a gastronomia tradicional e é receptivo à experimentação de novos, porém autênticos, sabores, tendo sido reiterado por 22,6% dos gestores e proprietários inquiridos que os turistas manifestam um interesse "*em experimentar coisas novas*", uma curiosidade em saber como os pratos são confecionados e seus ingredientes (9,4%), cingindo-se esta atenção aos pratos mais divulgados e conhecidos, fenómeno que é fruto da iconicidade gastronómica e respectivo *marketing*, fundamentalmente ligado à realização de festivais, feiras e workshops (Henriques & Custódio, 2010).

Num estudo de Domingos & Henriques (2015) sobre o caso específico da doçaria algarvia, entidades públicas e privadas assumem a sua condição de atrativo de enriquecimento da experiência turística, cujo reconhecimento, também coadjuvado pela classificação da *Dieta Mediterrânica* como *Património Imaterial da Humanidade pela Organização das Nações Unidas para a Educação, Ciência e Cultura* (UNESCO), assenta, na autenticidade e qualidade dos produtos, sendo a sua valorização turística considerada um factor de desenvolvimento da economia local.

A abordagem deve, assim, ser posta, muito e acima de tudo, para além do espectro do incremento de competitividade concorrencial turística, pelo que deverá consignar-se à premência de crescente e contínuo reforço da resiliência do destino através da diversificação de produtos turísticos *per se* e da região que o consubstancia e é consubstanciada (Palekiene et al., 2015).

No caso da região do Algarve, essencialmente renomeada como destino de sol e mar, impõe-se, fundamentalmente, a premência da diversificação de produtos turísticos que consolidem uma heterogeneização e qualificação da experiência turística no Algarve com vista à debelação da estandardização do exotismo e estilo internacional que, no âmbito gastronómico, se reflecte pelo uso recorrente da cozinha internacional e de *fast food* (Henriques & Custódio, 2010; Domingos &

Henriques, 2015), o que, inerentemente, poderá tornar este destino mais competitivo, de visitação menos sazonal e, principalmente, mais resiliente.

No mesmo artigo, descortinou-se que as maiores fraquezas sinalizadas são a limitada consciencialização dos promotores, relativamente à importância do património gastronómico regional, o parco envolvimento de *stakeholders*, o reduzido financiamento nos domínios da promoção aos visitantes, profissionais de turismo e restauração, e, também, aos residentes para o conhecimento e valorização deste património, enquanto produto turístico. É, ainda, realçada a necessidade de reforço na criação de parcerias entre entidades públicas, nomeadamente as câmaras municipais e a *Entidade Regional de Turismo do Algarve*, e privadas como a *Associação Turismo do Algarve*, empreendimentos hoteleiros, demais associações e alojamentos, no âmbito da organização de eventos, desde palestras, concursos gastronómicos, mostras de degustação de produtos regionais, workshops e ateliers (Domingos & Henriques, 2015). O uso e/ou oferecimento de produtos regionais em empreendimentos e restaurantes poderia, porventura, ser profícuo, sendo frutuoso ponderar o estudo de sinergias entre a oferta e a procura por alavancagem promocional numa potencial e plausível associação do património gastronómico a outros produtos turísticos como o sol e mar (Domingos & Henriques, 2015), como, por exemplo, ensaiar uma simbiose entre os empreendimentos turísticos do litoral algarvio e a produção local.

3. CABAZ ALGARVIO: UMA EXPERIÊNCIA DE VALORIZAÇÃO TURÍSTICA DA DOÇARIA REGIONAL

3.1. Abordagem e Métodos

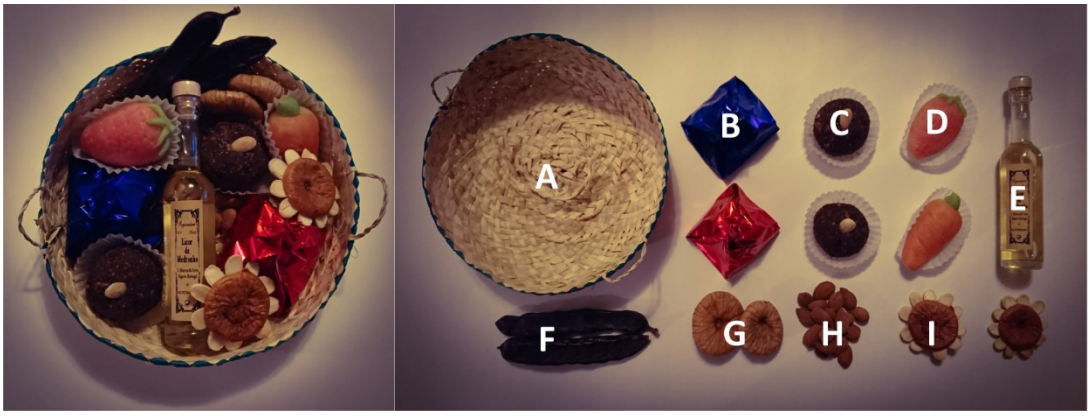
Tendo em linha de pensamento a conceptualização, até aqui, discorrida, foi construído um modelo analítico que se baseou no inquérito de dois estratos segmentários com maior representatividade no número de hóspedes alojados na região do Algarve em 2016, cujas proveniências ao nível do país de residência são, em primeira instância, de Portugal e Reino Unido (INE, 2017), no sentido de aferir as suas preferências por doçaria regional e disposição a pagar pela disponibilização de um cabaz de doces regionais em cada quarto dos alojamentos turísticos colaborantes com o presento intento de estudo.

Concretamente, foram dois os estabelecimentos registados como alojamento local com capacidade de três quartos cada e, respectivamente, de 6 hóspedes, que adjuvaram a realização deste estudo, situados nas proximidades da Praia da Galé (Leste e Oeste), freguesia da Guia, concelho de Albufeira e, como tal, em pleno centro do Litoral algarvio.

O período de estadia mínima nos referidos estabelecimentos de alojamento local é de uma semana. A amostra de turistas inquiridos nos mesmos alojamentos coadjuvantes foi constituída por 65 indivíduos, sendo 19 dos mesmos residentes em Portugal e 46 residentes no Reino Unido. O tamanho da amostra e o número reduzido de estabelecimentos coadjuvantes conferem um carácter não probabilístico, não aleatório e conveniente (Marôco, 2014) a esta análise, uma vez que o estudo, que aqui se apresenta, foi limitado ao ónus da aquisição e criação de um cabaz de doces regionais no valor monetário de 10€ cada e pela disponibilidade de apenas um técnico superior na operacionalização do processo de inquérito e entrega dos cabazes aquando de cada check-in semanal ou bissemanal nos alojamentos em causa, o que inviabilizou a aplicação instrumental de uma amostragem aleatória com sólida condição extrapolativa. Note-se que análise estatística dos dados do inquérito foi realizada através do recurso ao software *IBM SPSS Statistics 24*.

O cabaz ofertado em cada quarto dos ditos alojamentos foi criado por uma combinação constituinte de frutos secos e produtos de doçaria regional (figura 1 e 2), reconhecidos na publicação "*Alma Algarvia*" (2017), elaborada e divulgada pela Entidade Regional de Turismo do Algarve, enquanto identitários da região do Algarve.

FIGURAS 1 E 2 - CABAZ CRIADO E DISTRIBUÍDO POR QUARTO DE HÓSPEDES, E SUA CONSTITUIÇÃO.



Legenda: A – Cabaz artesanal de empreita de palma; B – Dois Dom Rodrigo's: doce com o título honorífico associado à antiga nobreza algarvia, formado por uma porção de fios e doce de ovos com amêndoa, embrulhados em papel de prata colorido; C – Dois Queijos de Figo: mistura consistente de figo e amêndoa; D – Bolinhos de Amêndoa ou Doce Fino: uma envolvência de massapão de amêndoa esculpida nas mais variadas formas, mimetizando frutos, contendo no seu interior fios e doce de ovos; E – Licor regional; F – Duas alfarrobas; G - Dois figos; H – 100 gramas de amêndoas; I – Duas Estrelas de Figo e Amêndoa torrada.

O grau de gosto a auscultar fez-se mediante uma escala de resposta numérico-referenciada (Moreira, 2004) com adverbiação crescente: 1 – Não gosto; 2 – Gosto pouco; 3 – Gosto relativamente; 4 – Gosto razoavelmente; 5 – Gosto; 6 – Gosto muito; 0 – Não sabe/não responde.

Quanto ao inquérito sobre a disposição dos hóspedes a pagar mais 10€ na sua estadia turística para desfrutar da oferta deste cabaz no seu quarto, a escala de resposta utilizada pautou-se por referenciar os seguintes níveis de disposição: 1 – Nada disposto; 2 – Pouco disposto; 3 – Relativamente disposto; 4 – Razoavelmente disposto; 5 – Disposto e 6 – Totalmente disposto; 0 – Não sabe/não responde.

A aplicação do inquérito em causa efectivou-se em período de época alta, precisamente entre 6/05/2017 e 16/09/2017, permitindo apresentar os resultados que, seguidamente, se discutem.

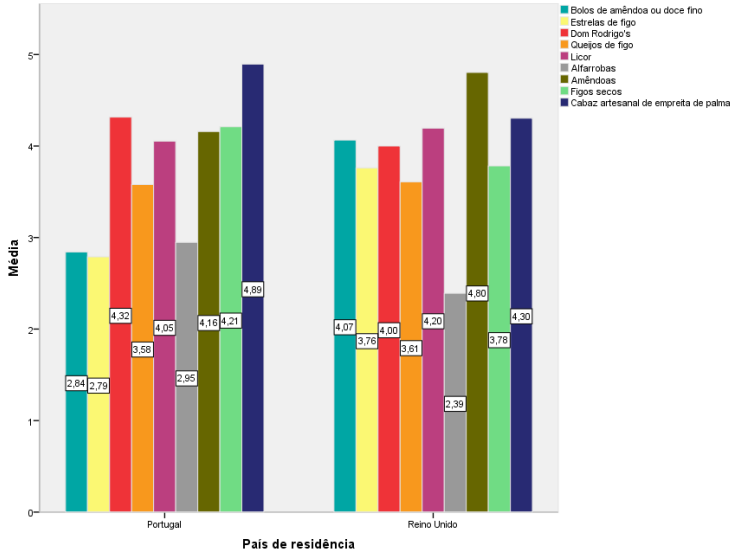
3.2. Preferências dos hóspedes em alojamentos turísticos pela doçaria da região do Algarve, Portugal

A disponibilização por oferecimento de cabazes de doçaria regional a hóspedes dos alojamentos colaborantes permitiu aferir diferenças nos gostos expressados dos mesmos, mediante um *background* sociocultural distinto e distintivo, determinado pelo país de residência dos estratos de turistas que mais visitam a região do Algarve, nomeadamente Portugal e Reino Unido.

No primeiro caso (Portugal), verificou-se que um razoável grau de gosto, portanto um nível 4, explicitado no questionário, enquanto "*Gosto razoavelmente*", o qual recai sobre o cabaz de empreita de palma (nível de gosto de 4,89, numa escala de 1 a 6), sobre o doce Dom Rodrigo (4,32), figos secos (4,21), amêndoas (4,16) e licores (4,05) e sobre os queijos de figo (3,58), sendo que os restantes três dos nove produtos se encontram num limiar inferior ao sequer gosto relativo (nível 3), como é evidenciado na figura 3.

Já no que concerne aos turistas provenientes do Reino Unido, os produtos predilectos e por ordem decrescente de gosto razoável são as amêndoas (4,80), o cabaz artesanal (4,30), os licores (4,20), bolos de amêndoa (4,07), Dom Rodrigo (4,00) e queijos de figo (3,61), ao passo que as alfarrobas não foram produtos, profundamente, apreciados na constituição do cabaz ofertado (figura 3).

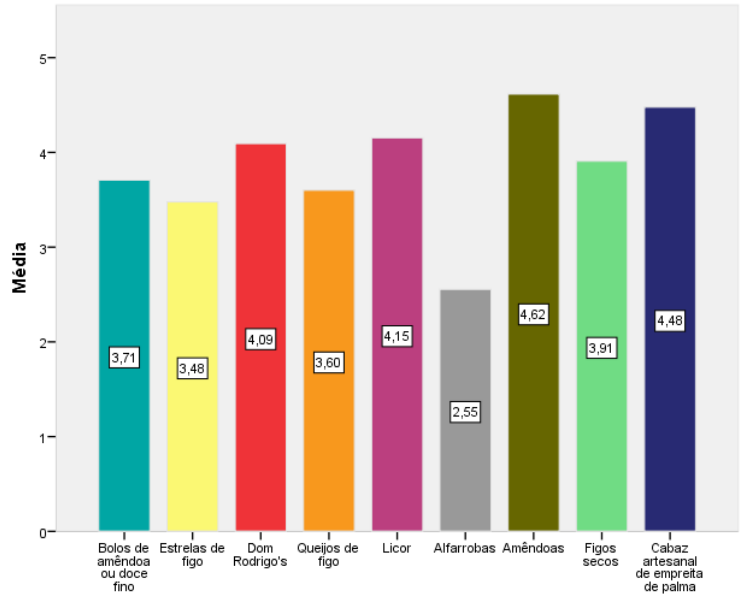
FIGURA 3 – PREFERÊNCIAS DOS HÓSPEDES EM ALOJAMENTOS TURÍSTICOS PELA DOÇARIA REGIONAL DO ALGARVE, MEDIANTE O SEU PAÍS DE RESIDÊNCIA.



Escala: 1 - Não gosto; 2 - Gosto pouco; 3 - Gosto relativamente; 4 - Gosto razoavelmente; 5 - Gosto; 6 – Gosto muito; 0 – Não sabe/não responde

Logo, pelo explanado e pela agregação das manifestações de gosto integrado de visitantes de Portugal e do Reino Unido, não é de espantar que os produtos mais apreciados e, portanto, que suscitam um grau de gosto razoável, sejam as amêndoas (4,62), o cabaz artesanal (4,48), o licor (4,15) e o Dom Rodrigo (4,09). Já os figos secos (3,91), os bolos de amêndoa (3,71), os queijos de figo (3,60) e as estrelas de figo (3,48) assumem uma posição intermédia em termos de gosto, ainda considerado razoável, ao passo que as alfarrobas (2,5) não foram, grandemente, apreciadas (figura 4).

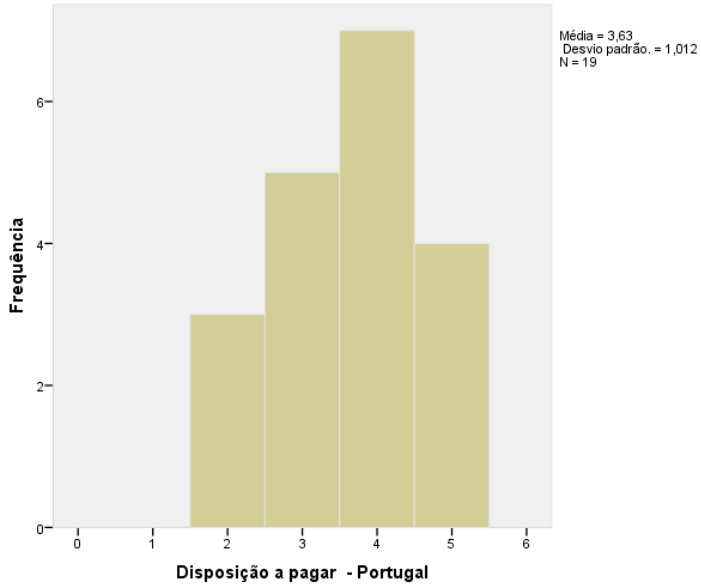
FIGURA 4 – PREFERÊNCIAS AGREGADAS DOS HÓSPEDES EM ALOJAMENTOS TURÍSTICOS PELA DOÇARIA REGIONAL DO ALGARVE.



Escala: 1 - Não gosto; 2 - Gosto pouco; 3 - Gosto relativamente; 4 - Gosto razoavelmente; 5 - Gosto; 6 – Gosto muito; 0 – Não sabe/não responde

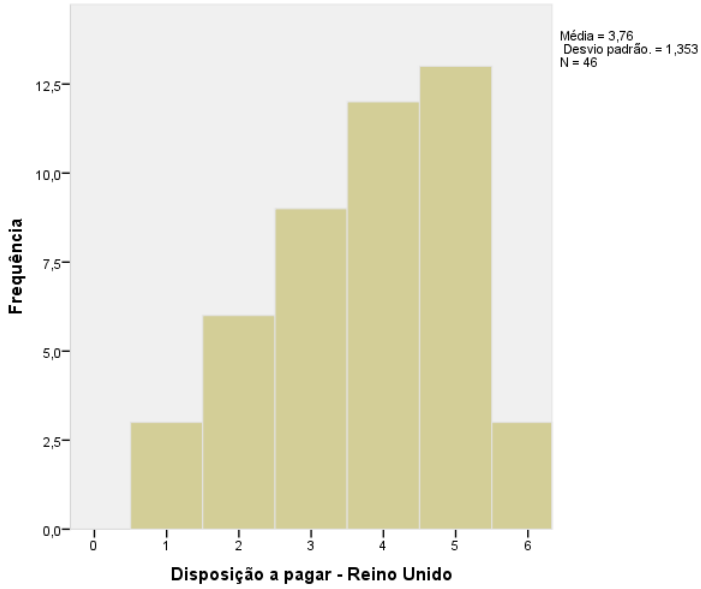
Ora, mediante estes dados e gostos expressos, importou, também e efectivamente, auscultar a disposição dos turistas a pagar a mais 10€ por quarto de hóspedes, na sua estadia em alojamento, pelo oferecimento deste cabaz, cujo histogramas de frequência estatística se apresentam nas figuras 5, 6 e 7.

FIGURA 5 – DISPOSIÇÃO A PAGAR (MAIS 10€ POR QUARTO NA SUA ESTADIA TURÍSTICA COM VISTA A DESFRUTAR DO CABAZ ALGARVIO) DECLARADA PELOS TURISTAS, RESIDENTES EM PORTUGAL, QUE VISITAM A REGIÃO DO ALGARVE.



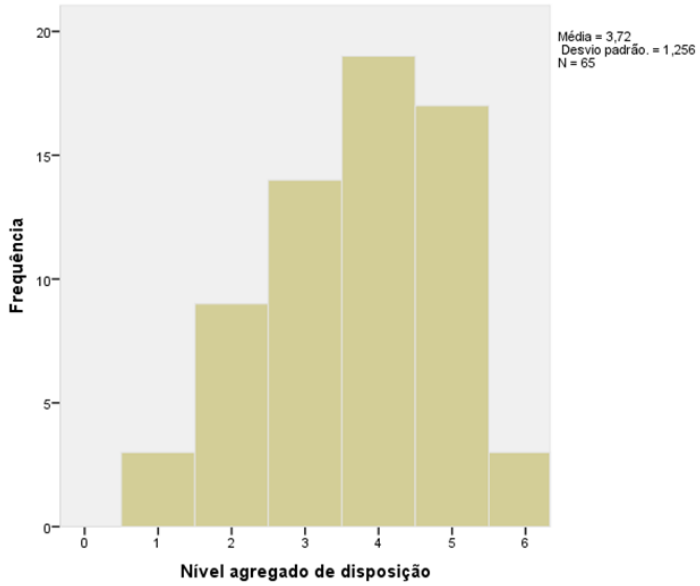
Escala: 1 - Não gosto; 2 - Gosto pouco; 3 - Gosto relativamente; 4 - Gosto razoavelmente; 5 - Gosto; 6 – Gosto muito; 0 – Não sabe/não responde

FIGURA 6 – DISPOSIÇÃO A PAGAR (MAIS 10€ POR QUARTO NA SUA ESTADIA TURÍSTICA COM VISTA A DESFRUTAR DO CABAZ ALGARVIO) DECLARADA PELOS TURISTAS, RESIDENTES NO REINO UNIDO, QUE VISITAM A REGIÃO DO ALGARVE.



Escala: 1 - Não gosto; 2 - Gosto pouco; 3 - Gosto relativamente; 4 - Gosto razoavelmente; 5 - Gosto; 6 – Gosto muito; 0 – Não sabe/não responde

FIGURA 7 –NÍVEL AGREGADO DE DISPOSIÇÃO A PAGAR (MAIS 10€ POR QUARTO NA SUA ESTADIA TURÍSTICA COM VISTA A DESFRUTAR DO CABAZ ALGARVIO) DECLARADA PELOS TURISTAS, RESIDENTES EM PORTUGAL E NO REINO UNIDO, QUE VISITAM A REGIÃO DO ALGARVE.



Escala: 1 - Não gosto; 2 - Gosto pouco; 3 - Gosto relativamente; 4 - Gosto razoavelmente; 5 - Gosto; 6 – Gosto muito; 0 – Não sabe/não responde

Os respondentes encontram-se, relativa a razoavelmente (nível médio de 3,72), dispostos a pagar mais 10 € por quarto alugado para desfrutar da oferta deste cabaz de produtos de doçaria da região do Algarve, pelo que os turistas do Reino Unido manifestaram maior disposição (3,76) do que os portugueses (3,63) para o efeito (figuras 5, 6 e 7).

4. CONCLUSÕES

O património gastronómico e a identidade que em si não só se preserva, como se recria por inovação, são apresentados neste artigo na instância de atributos, marcadamente, diferenciadores e consolidativos da experiência do turista que visita a região do Algarve, por oposição à apologia territorial de serviços de turismo prestados por qualquer destino tropical que, em parte, tem consignado, por mimetismo, o carácter da oferta turística do Litoral algarvio.

Assumiu-se e assume-se uma visão integrada de que a produção local pode constituir uma mais-valia para o sector turístico algarvio, não apenas pela potencial e opípara criação de valor, mas, acima de tudo, pela emergência de sentido no cumprimento do desenvolvimento desta região.

O estudo empreendido revela que, colmatado o desconhecimento dos visitantes da região pela apresentação de produtos locais, neste caso, pela degustação da doçaria mais representativa dos sabores e saberes gastronómicos da região, se verifica um franco grau de gosto pelos doces regionais por parte dos turistas e uma assinalável disposição a pagar mais 10€ por quarto de hospedagem para receber esta oportunidade gustativa aquando da sua estada turística na região.

Posta e comprovada está a tese de que seria profícua a disponibilização, em quartos de alojamentos turísticos, do estudado cabaz de produtos gastronómicos e artesanais ou a recriação de um outro modelo homólogo do mesmo em hotéis, apartamentos turísticos, estabelecimentos de turismo rural, de turismo de habitação, e alojamento local, entre demais, sendo esta iniciativa um robusto incentivo incremental da coesão territorial e atenuação de assimetrias patentes na região do Algarve, na medida em que, derradeiramente, a comercialização directa ou indirecta destes cabazes e respectivos produtos nestes empreendimentos turísticos permitiria redinamizar, para lá, mas pelo

Litoral, outras unidades de paisagem como o Barrocal e a Serra algarvia, os quais constituem o cerne da *Infraestrutura Verde* da região, cuja produção vai desde a agricultura em pomares de sequeiro mistos de amendoeiras, figueiras, alfarrobeiras e oliveiras, pomares de regadio de laranjeiras à colheita de ervas aromáticas, à destilação do medronho, à apicultura, ao pastoreio caprino, entre outros, matriz que construiu e constrói o legado da variante algarvia da dieta mediterrânica.

Apesar do carácter qualitativo e não aleatório do exercício empreendido não fundamentar uma sólida capacidade extrapolativa de ordem quantitativa na instrução do planeamento estratégico do sector turístico e da gestão territorial, o presente artigo permite clarificar aspectos críticos e identificar oportunas potencialidades, no que concerne à valorização turística do património gastronómico regional, reconhecendo-o, na sua autenticidade, como atributo tanto qualificador como diferenciador da experiência de quem visita a região.

Face ao explanado, caberia à tutela turística, nomeadamente à Entidade Regional de Turismo do Algarve, via valorização turística e qualificação do território, adjuvada, neste segundo ponto, pela Comissão de Coordenação e Desenvolvimento Regional do Algarve e pelas Câmaras Municipais algarvias, as quais detêm a tutela da gestão territorial concelhia, e à Associação do Turismo do Algarve, via promoção, dinamização do destino e consciencialização dos empreendimentos turísticos, a valorização turística do património gastronómico e a definição de incentivos à execução desta experiência numa escala mais ampla.

O presente artigo cumpre o desiderato de instruir as políticas públicas de gestão turística e territorial de conhecimento qualitativo que valide a potencial eficácia e eficiência na concretização deste ensaio empírico num modelo a ser aplicado à escala regional com o almejo de estabelecer uma forte sinergia não, apenas, entre entidades públicas e privadas, mas acima de tudo entre empreendimentos turísticos e produção local em prol do desenvolvimento e coesão territorial.

Tal elo sinergético poderia robustecer a resiliência regional por diversificação e diferenciação face a potenciais alterações de atratividade turística, que venham, porventura, a ocorrer por perda concorrencial na senda contemporânea pela competitividade e/ou, por inerência, dos impactos das alterações climáticas sobre o sector turístico da região do Algarve.

Agradecimentos

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Public policies in Europe's polarised political culture: the radical turn of Portugal´s left wing bloc party in 2011

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ABSTRACT

The aim of this article is to contrast right-wing and left-wing policies held by populist parties in their manifestos and in parliaments across Western Europe. This comparative approach will facilitate a scrutiny of those policies against policy making analytical frameworks such as the *Institutional Collective Action Framework*, the *Ecology of Games Framework, The Policy Regime Perspective, The Robustness Framework and the Collective Learning Framework.* Theoretical frameworks can give an insight into blind spots and consequent dilemmas of populist policy ingrained in policy proposals put forward left wing parties like Syriza Unifying Social Front (Syriza) in Greece, Bloco de Esquerda (Left-wing Bloc) in Portugal, and Podemos (We Can) in Spain and proposals submitted by right-wing forces like the Swiss Schweizerische Volkspartei (SVP), the French National Front , the National Democratic Party (NPD) in Germany and the Populist Radical Party (PRP) in Italy, just to mentio a few. This article highlights that even under situations of crisis and polarised political culture policy makers must be prepared to reject unworkable policies. This article considers left-wing party Bloco de Esquerda which in 2011 adopted populist policies confronting Portugal's *anti-populist* mind set since democracy was restored, in 1974.

Keywords: Policy making, political behaviour**,** populism, Western Europe, Eurozone crisis, Left-Wing Bloc.
JEL Classification: D72, D81, Z18, C020

1. INTRODUCTION

One of the main contentions in this article is that it is highly questionable whether populist political forces in Europe can assume power or challenge liberal democracy. Yet, populist policy making in contemporary Europe does erode liberal consensus (Albertazzi and Miller, 2013:365) that has provided "one of the foundations of the European project from its very start" (Myers 2017:14). Populist right-wing policies erode liberal consensus whilst concentrating on short-term issues such as migration and the exclusion of immigrants from benefits provided by the welfare state. Left-wing populist parties on the other hand have been pushing harder for the *European New Deal*, presented in *A Modest Proposal for Resolving the Eurozone Crisis* (Y. Varoufakis, S. Holland and J.K. Galbraith, July 2013) rather than gambling on a fragmented Europe.

The emergence and success of populist parties may not be long lived but proposals by radical right-wing parties can affect citizens' political behaviour, nurturing intolerance (Andersen and Evans, 2003; Bohman, 2011; Dunn and Singh, 2011; Immerzeel, 2015; Ivarsflaten, 2005; Semyonov et al., 2006; Sprague-Jones, 2011; https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5600260/ - bibr154-0011392117717294Muis and Immerzeel, 2017). Whilst promoting very wide policies such as anti-

capitalism, social justice, pacifism and anti-globalization, left-wing populist policies can be inclusionary and democratic but equally risky when not well planned. Inadequately designed policies suffer from a lack of prospective revisions regarding their validity, feasibility and consequences for society. These risky policies may result in unfairness to younger generations and a fragmented Europe.

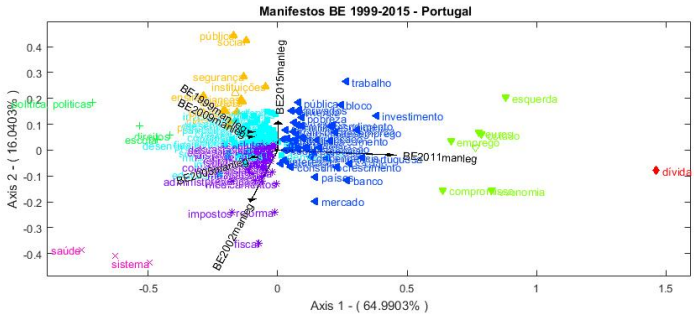
This article investigates populist policy making in national contexts shaped by the European Union Great recession of 2009 to contrast populist policies held by right-wing and left- wing parties in their manifestos and parliamentaty activities. This comparative approach is meant to help a discussion of policy making frameworks which can give an insight into the predicaments of populist policy making in polarised Europe. Special attention is given to Portuguese politics. Portugal is a country in which there is little space for populism probably because Portuguese economic migration militates against the rise of anti-immigrant populists. Due to the legacy of dictatorship, Portuguese voters also refrain from supporting left-wing populism. One case of interest is the Portuguese left-wing party Bloco de Esquerda (funded in 1999) and its short incursion into radical anti-European economic policy proposals during the 2011 elections for the legislative. For a short period, the Bloco de Esquerda adopted a populist left-wing radical position in its manifesto *Change the Future: defense of employment and Social Justice* in which BE policy proposals converged with policies supported by left-wing populist parties such as Syriza (Grece) and Podemos (Spain). In 2011, after Portugal's request for an EU-IMF bail-out, the Bloco de Esquerda was however punished in the polls when despite of recession and high unemployment Portuguese voters continued to suport established moderate parties by a large majority.

As it will become clear in the next pages, the consequences of a detour from Bloco de Esquerda's established positions could have foreseen with reference to a *Policy Regime Perspective* (PRP). Policy makers are encouraged to reflect on "the role of policies as governing instruments and to consider more fully the factors that shape their political impacts*".* (May and Jochim, 2013:426).

2. METHOD

This qualitative desk based research on populist policy making is a follow up from a previous research on 'Mediterranean Democracies: Portugal, Greece and Spain', carried with Eugénia Ferreira, In this previous work we promoted three case studies of the left-wing populist revival in Southern Mediterranean democracies. The central issue highlighted in these case studies was the adherence of the Portuguese Bloco de Esquerda to the populist anti-austerity movement in the mould of PODEMOS in Spain, and SYRIZA in Greece. With the support of HJ Biplot methodology and content analysis we presented evidence showing sequential changes in the discourses of representatives from the Bloco de Esquerda (Francisco Louçã and Catarina Martins, Portugal), Pablo Iglesias (PODEMOS, Spain), and Alexis Tsipras (SYRIZA, Greece). The HJ-Biplot method (Galingo, 1986) permitted a simultaneous graphic representation of lines and collumns of a data matrix, based on a Singular Value Decomposion (SVD). The matrix lines (standing for words in manifestos) were represented by means of dots and collumns (standing for manifestos/year) were represented by means vetors, in a bidimensional space. This representation corresponds to the best simultaneous graphic depiction of multiple cases in a same space (Galindo 1985, 1986 e Galindo e Quadras, 1986). The Hj-Biplot method allowed us to establish three types of relations in a bidimensional diagram containing the relation between words, the relation between manifestos and the relation between words and manifestos over time, as seen in Diagram 1 with focus on the Left Bloc party manifestos from 1999 to 2015.

DIAGRAM 1- BLOCO DE ESQUERDA MANIFESTOS 1999-2015



Source: Lampreia Carvalho, F. and Ferreira, Eugenia (2017)

With the above diagram we demonstrated that in 2011, the Bloco de Esquerda departed from its previous policy proposals supported from 1999 to 2009. The BE's commitments in the 2011 Legislative elections were to "Confront debt, save the economy, create employment and social respect". (Bloco de Esquerda Manifesto 2011: 2). In the 2011, the BE Manifesto placed Portugal in a relation of equivalence to the situation imposed on Greece and Ireland:

"*The glossy unfair conditions imposed on Greece, Ireland, and Portugal conduce these countries to a delayed ruin. The spiral to an abyss can only be avoided by a rigorous renegotiation. The Bloc proposes a renegotiation establishing new deadlines, new interest taxes and reasonable conditions that should follow an economic recovery and cancels the existing debt. Instead of being a business opportunity for creditors in peripheric countries, present difficulties should rally a politics of European cooperation against speculation*" (Bloco de Esquerda Manifesto, 2011:2).

The present paper discusses what policy making theories and tools were available to Bloco de Esquerda to scrutinise the socio-political context and the feasibility of its policies in Portugal before delivering policy proposals for a rigorous renegotiation of the country's debt. Yet, before considering aspects of the contemporary policy making theory, the next section contrasts right-wing and left-wing populist policies advocated by Western European parties to give an insight into radical policy proposals that have emerced in the last ten years as response to the eurozone crisis.

2. POPULIST POLICY MAKING CONTRASTS IN EUROPE

Bobba and McDonnell (2016) highlighted that before 1994 right-wing populist parties did not govern in Western European countries. One exception was Italy in 1994, when Forza Italia (FI – Come on Italy) and the Lega Nord (LN – Northern League) governed with other parties in a coalition for just over six months. In the 2000 right-wing populist parties began to play a part in governments around Western Europe. The Freiheitliche Partei Österreichs (FPÖ – Austrian Freedom Party) entered government alongside the centre-right. In 2001, a four-party government containing FI and the LN was formed in Italy. Subsequently, the Lijst Pim Fortuyn (LPF – Pim Fortuyn List) joined a coalition in the Netherlands. Since 2008, right-wing populists have returned to government in Italy, also joining coalition governments for the first time in Finland, Greece and Norway. Right-wing populist parties aaaalso provided critical parliamentary support for minority governments in Denmark and the Netherlands. (Bobba and McDonnell, 2016:281).

Bobba and McDonnell (2016) studied changes in the emphases placed on the different elements of right-wing populist discourse between opposition and government but concluded that the main features of the parties' populist discourse remain broadly the same. For example, the Lega Nord (LN) reduced its criticisms of elites when in office. The authors could not corroborate an argument saying that entry into government brings moderation of populist discourse (Akkerman et al. 2016, pp. 3–4). What is evident is that populist right-wing parties in Europe converge ideologically, support similar policies and collaborate internationally. For example, after the 2014 European elections, Heinz-Christian Strache (FPÖ) and the leader of the French National Front, Marine Le Pen, publicized deeper cooperation between their parties. The Freedom Party of Austria FPÖ *Freiheitliche Partei Österreichs* joined the National Front, the Northern League, Vlaams Belang and the Czech Civic Conservative Party, forming the Movement for a Europe of Nations and Freedom.The Freedom Party of Austria FPÖ participated along with the Dutch Party for Freedom, the Alternative for Germany, the Polish Congress of the New Right and a former member of the UK Independence Party in the Europe of Nations and Freedom parliamentary group.

Table 1 bellow demonstrates the significant overlap between right-wing populist parties in Western Europe, with some variation as it is the case with Neo-Nazism and ultra-nationalism policies defended by National Democratic Party of Germany, UKIP's hard Euroscepticism leading the removal of the United Kingdom from the European Union (EU) and the Swiss -Schweizerische Volkspartei (SVP) defense of Agrarianism in addition to other issues. Overlapping policies however dominate Right-wing populist parties support of Euroscepticism and anti-immigration policies.

TABLE 1 – RIGHT WING POPULIST POLICIES IN WESTERN EUROPE

Country/Party	Right-Wing and Centre-Right Populist Policies
Austria Freedom Party of Austria (FPÖ) Freiheitliche Partei Österreichs. Founded 7 April 1956. In 2017 obtained 1,316,442 of total vote or 26% with 51/ 183 searts in the National Council parliament as Junior party of the Austrian People's Party (ÖVP), and 96/440 in State Parliaments	National conservatism Anti-immigration Euroscepticism German nationalism National liberalism National conservative policies focus on national interests. FPÖ upholds cultural or ethnic identity than most other conservatives. Public policies promote opposition to immigration, mostly from the Islamic world and euroscepticism. Today the party promotes its role as a guarantor of Austrian identity and social welfare. Economically, the FPÖ encourages regulated liberalism with privatisation and low taxes, combined with support for the welfare state. FPÖ sustains that it will be impossible to uphold the welfare state if current immigration policies are continued.
Belgium- Vlaams Belang (VB; Dutch for "Flemish Interest") Founded in 14 November 2004. Affiliated to the Movement for a Europe of Nations and Freedom. Presence in Flemish Provincial Councils-29/351.	Flemish nationalism- for greater autonomy of the Belgian region of Flanders, for protection of the Dutch language, for the overall protection of Flemish culture and history. For splitting from Belgium and forming an independent state. Separatism National conservatism Economic liberalism Euroscepticism
Denmark- Danish People's Party (DPP) (Danish: *Dansk Folkeparti*, DF) Founded: 6 October 1995 Seats in Regional Councils 23/205. Seats in Municipal Councils 255/2,444. Seats in the European Parliament 3/13.	Danish nationalism National conservatism Social conservatism Euroscepticism Nativist Anti-Muslim Anti-immigrant: In 2010, DPP proposed to put a complete stop to all immigration from non-Western countries, a continuation of a

In 2006, the party's popularity rose intensely in opinion polls following the Jyllands-Posten Muhammad cartoons controversy.

France

Front National

Party founded in 5th October 1972.

Affiliated to Movement for a Europe of Nations and Freedom.

Holds 8/577 seats in National Assembly. Holds 17/74 seats in European Parliament and 358/1,758 of Regional Councils.

Between 2012 and 2017, the FN was only weakly present in the French Parliament since the party had only obtained 2 seats (out of 577) in the National Assembly and 2 seats (out of 348) in the Senate. Its representation was thus marginal and could not allow the party to create a parliamentary group. This had consequences for the party's ability to directly influence policy-making through institutions.

Germany -National Democratic Party of Germany (German: *Nationaldemokratische Partei Deutschlands*, NPD)

Founded on 28 November 1964.

NPD has no seats in the Bundestag. In the European Parliament the NPD holds 1/96 seats.

Italy

Popolo della Libertà (PDL)

Launched: 18 November 2007

Founded: 27 March 2009

(founded) Considered as a Centre-Right personal party to Silvio Berlusconi, a party akin to Forza Italia.

Merger of Forza Italia, National Alliance and minor parties.

Ambition of being a longlasting centre-right force, affiliated European People's Party

Presence in the Chamber of Deputies- in 2013, PDL conquered 7,332,667 of votes or 21.6% winning 98/ 630 seats

proposal the month before to toughen the 24-year rule. DPP promotes Europe's strictest immigration laws.

The party does not accept a multi-ethnic transformation of Denmark, and rejects multiculturalism.[I]

French nationalism

National-conservatism and Souverainism

Economic nationalisation; Protectionism

Anti-immigrationand anti-terrorism; Hard-Euroscepticism

Against Islamisation of French culture

Law-and-order platform of zero tolerance (2002) with harsher sentencing, increased prison capacity, and a referendum on re-introducing the death penalty.

Halting the migration of Tunisian and Libyan immigrants to Europe.

Goal to have a net legal immigration rate (immigrants minus emigrants) of 10,000 in France per year (2015).

Critique of globalism and capitalism for industries like health, education, transportation, banking and energy.

Front national's manifesto in 2012 proposed:

1.No social aid should be given to a repeat offender or to a criminal having received a jail sentence of one year or more

2. Prohibiting an offender from entering in a specific territory during a period after having served his sentence

3. Increasing penalties for students or their parents when they are guilty of verbal or physical aggression against a teacher

4. Expulsing criminal foreigners

5. Racism against French people as a motive for a crime or an offence should be considered as a particularly aggravating circumstance.

6. Reinstating the death penalty or creating a real-life imprisonment.

Neo-Nazism; Ultranationalism; Pan-Germanism

Anti-immigration; Anti-globalism.

Defends anti-immigrant, anti-refugee, anti asylum seekers policies.

Policies on justice, pro-welfare and social security are formulated according the traditional xenophobic rhetoric. Welfare services should be restricted to the native population.

Regional governments to determine the amount of construction for social (subsidized housing), as well as the amount that the regional governments will pay in rent and housing subsidies.

Considering the German party practice of the application of the policy through the party system (Art 2007), it is unlikely the NPD will have much influence on policymaking in government.

Liberal conservatism[I]

Christian democracy

Liberalism

More public efficiency

Less taxes.

A more efficient, less expensive and more inclusive system of social protection supported by the community founded on the relation between the people.

Socio-sanitary integration

Attack to poverty

Educational pluralism

Overcome the political institutional weakness affecting Italy.

Fair, impartial and efficient Judicial system.

Institutions against organizsed crime

Progress founded on the efficiency of the public sphere and on the vitality of its society.

Italy- Forza Italia (FI – Come on Italy) Forza Italia: a personalistic party founded to bring Berlusconi to power, casting him as the country's sole possible saviour (McDonnell, 2013:220). Together with PDL and the LN, Forza Italia was one of the major parties of government from 2008 to 2011	Defence of 'neoliberal populist'policies (Mudde 2007; Taguieff 2003). Promisses of low taxes More public works Reform of the public administration Visceral anti-communism (pleasing to many former Christian Democrats and others) (McDonnell, 2013:220).
Italy- Lega Nord (LN – Northern League. A personalised party. Together with PDL and the FI was one of the major parties of government from 2008 to 2011	Policies 'aligned with and 'ethnoregionalist populism' (Spektorowski 2003) or 'radical right populist' (Norris 2005; Mudde 2007)
Holland- LPF – Pim Fortuyn List (Dutch: *Lijst Pim Fortuyn)* Founded in 14 February 2002 Dissolved in 1 January 2008 Up to 2003, the LPF integrated a coalition government with the Christian Democratic Appeal (CDA) and the People's Party for Freedom and Democracy (VVD). Conflicts in the LPF led to the coalition's break-up. After the 2003 elections LPF was left in the opposition to government.	Immigration issues Policies considering Islam as "a backward culture" No more asylum seekers allowed into the country Repeal of anti-racism clauses in the Dutch Constitution to protect freedom of speech.
Switzerland-Schweizerische Volkspartei (SVP) Founded in 22 September 1971. National Councils -65/200 Cantonal legislatures- 590/2,609 The Party is influent at the agenda setting stage of policy-making. Direct democracy tools are available in Switzerland and, therefore, can be *activated by the SVP to influence the entire policy-making process*	Swiss nationalism; National conservatism; Economic liberalism Agrarianism; Anti-immigration; Homeland security policy; Isolationism, Euroscepticism; Preservation of Switzerland's political sovereignty and a conservative society. Promotes the principle of individual responsibility and is skeptical toward any expansion of governmental services Refusal of an accession of Switzerland to the European Union. Refutation of military involvement abroad. Refusal to increases in government spending on social welfare and education. Supports stricter asylum laws and to reduce immigration. Supports *supply-side economics*, arguing that economic growth can be most effectively created by lowering taxes and decreasing regulation.
England- The UK Independence Part- UKIP Founded in 3 September 1993. UKIP began as the Anti-Federalist League, a Eurosceptic political party established in 1991. The League opposed the recently signed Maastricht Treaty and sought to influence the governing Conservative Party toward removing the United Kingdom from the European Union (EU) Entered mainstream politics: 2014–16. Seats in the House of Commons- 0/650	Hard Euroscepticism; Economic liberalism; British nationalism. One in, one out" immigration system. Policies to introduce a ban on the wearing of the "dehumanising" burka and full-face coverings in public places partially because they "prevent intake of essential vitamin D from sunlight". Set a target to reduce net migration to zero over a five-year period. Place a moratorium on unskilled and low-skilled immigration for five years after the UK leaves the EU. No amnesty for illegal immigrants. To introduce a "social attitudes" test as part of a points-based immigration system. Banning the practice of Sharia law in the UK and to placing a moratorium on new Islamic faith schools. Cut the UK's foreign aid budget. To scrap the existing commitment to spending 0.7 per cent of GDP on foreign aid and reduce the aid budget to 0.2 per cent of GDP instead. Close the Department for International Development with the

Seats in the European parliament 20/73... Seats in Local government- 253/ 20,349	£10 billion saved every year put into the NHS. All EU flags to be banned from being flown from public buildings in the UK post-Brexit. Repeal the 2008 Climate Change Act and withdraw from the Paris climate change agreement. Replace first past the post with a proportional electoral system. Abolish the House of Lords. To bring forward new laws to require employers to advertise jobs to British citizens before they offer them overseas.

Table 2 demonstrates that Euroscepticism is a common policy area for all populist parties in Europe. however left and right-wing populist parties differ on the presence or absence of anti-immigration policies, the presence/absence of law and order policies, support for Democratic Socialism, and anti-capitalism policies.

TABLE 2 - POPULIST LEFT-WING POLICIES

Country/Party	Left-Wing Populist Policies
Greece- Popular Unity-Syriza Founded: 21 August 2015 The name of the party was inspired by Popular Unity, the Chilean political alliance led by Salvador Allende. Seats in European Parliament:1/21	Socialism[1];Euroscepticism; Greek withdrawal from the eurozone and reinstating the drachma as Greece's national currency. Write-off the greater part of public debt's nominal value Include a «growth clause» in the repayment of the remaining part so that was growth-financed and not budget-financed. Include a significant grace period («moratorium») in debt servicing to save funds for growth. Exclude public investment from the restrictions of the Stability and Growth Pact. A «European New Deal» of public investment financed by the European Investment Bank. Quantitative easing by the European Central Bank with direct purchases of sovereign bonds. The programme proposed a four pillar Plan for National Reconstruction: Confront humanitarian crisis; Reconstruct the economy and promote fiscal justice; Reconquer employment, and transform the political system to deepening democracy. Syriza supports socialist internationalism, pacifism, Greece's exit from NATO, and breaking military agreements with Israel.
Portugal- Left-Wing Bloc or Bloco de Esquerda (BE) (Portuguese) Founded on 24 March 1999. A founding member of the European Anti-Capitalist Left. Seats in the Assembly of the Republic (2015): 19/230 Seats in the European Parliament (2014): 1/21	Democratic socialism; Feminism; Euroscepticism; Anti-capitalism; Eco-socialism In its 2011 Electoral Manifesto the Bloco de Esquerda relied on a populist rhetoric proposing to confront debt, save the economy, create employment and social respect. In the National Assembly, the Bloco de Esquerda recommended laws on civil rights and guarantees, including the protection of citizens from racist, xenophobic, and homophobic discrimination, support for same-sex marriage, and laws for the protection of workers. The party also proposed Portugal's first law on domestic violence, which was then passed in parliament. At present, together with the PS, Left Bloc aims at: building a stable, long-lasting and reliable majority at the Parliament.
Spain- PODEMOS -We Can (Spanish). Founded on 16 January 2014 Seats in the Congress of Deputies: 43/350	Democratic socialism; Social democracy; Anti-globalisation; Direct democracy. Policies defnded in PODEMOS 2015 program: - Economic Democracy: Towards an energetic transition; Transports and infrastructures;

Seats in European Parliament: 5/54 Seats in Regional parliaments: 136/1,248.	A new productive model; A knowledge society; scientific policies; A fiscal reform for sufficiency, equity and social cohesion; Public banks and financial regulation; restructuration of the Spanhish debt; A social economy; Macroeconomic policies in Europe; The end of fiscal and salarial austerity; rights to better working conditions; policies to advance gender equality; and a quality pensions system. In 2016, PODEMOS proposed: The elimination of privileged bank secret in tax heavens.

4. CONTEMPORARY POLICY MAKING THEORY

A key element for a policy analysis of populist proposals is its validity and reliability against one or more analytical frameworks grounded on models of policy making. The latter can unlock conflicts and dead ends in populist policies more easily because the development of public policy-making is multifaceted, and it involves players from interest groups, governmental institutions, the media, and the research community, all of those holding dissimilar goals, perceptions of the situations and hand, as well as different policy predilections. With exception of the populist front PODEMOS, relevant in Spain, from 2010, populist policy makers in Europe are known to formulate public policies intra party and not necessarily involve a wide range of new and more established socio-economic groups in policy design. In its policy making outset PODEMOS followed principles such as respect, horizontality, transversality, diversity, debate, consensus, feminism, inclusivity, solidarity, and cooperation for the construction of the common welfare.

Schlager and Weible (2013: 389) proposed a comparative approach to perspectives on the policy process that could help advance the scholarship of populist policy thinking. The authors discussed six public policy theories here articulated with issues present in populist proposals (1) The Institutional Collective Action Framework by Richard Feiock; (2). The Ecology of Games Framework by Mark Lubell; (3). The Policy Regime Perspective by Peter J. May and Ashley E. Jochim; (4). The Robustness Framework by John M. Anderies and Marco A. Janssen; (5). The Collective Learning Framework by Tanya Heikkila and Andrea K. Gerlak; and 6. The Narrative Policy Framework by Elizabeth A. Shanahan, Michael D. Jones, Mark K. McBeth, and Ross R. Lane.

Why policy frameworks matter for the study of populist policies?

The Institutional Collective Action Framework (ICA), by Richard Feiock proposes that dilemmas in policy making emerge from the division of authority in which decisions by one government in one or more specific functional area impacts on other governments and other functions (Feiock, 2003:397). In this perspective the ICA framework focuses on *externalities of choice* in fragmented systems proposing the integration of multiple research traditions into a conceptual system to understand and investigate collective dilemmas that are persistent in contemporary governance planning and arrangements. The British referendum on the EU, for example, emerged from David Cameron strategy during the 2013 campaign. when confronted by both the rise of UKIP and the reactionary nationalist wing of his own party. By inviting people to vote for or against keeping the country in the European Union without foreseeing the consequences in the short and medium term, the Prime Minister risked participatory democracy, and this became clear when three judges found that the government could not start the formal withdrawal process by using the royal prerogative alone, and would need the backing of both the Commons and the Lords. The UK government had to seek to overturn the decision at the Supreme Court even before starting to implement the policy. At inception, a clash of aims challenged the continuity of the BREXIT policy- the British side held a single aim, that of maintaining the advantages of being in the EU while minimizing what it saw as the

disadvantages. On the other side, the EU had two aims - the first was to deflect harm to itself arising from the UK exit and the second aim would be "to establish a long-term economic relationship with the UK which was mutually beneficial, but which appropriately and demonstrably reflected "the negative consequences of British unwillingness to accept the responsibilities of EU membership". (Brendan Donnelly, 2017)[ii].

ICA dilemmas such as the ones emerging from BREXIT and the hypotetical Greek withdrawal of the eurozone, in 2012, can grow from dilemmas that arise directly from the division of authority in which decisions by one government in one or more specific functional area impact other governments and other governmental functions. Matching the scale of policy intervention to the specific scale and nature of policy problems, such as unwanted migration to the UK, and unwanted debt crisis in Greece is a well-established principle of policy design, but in practice this match is complicated by ICA dilemmas because the fragmentation of policy responsibility creates unexpected scenarios. If local actors pursue strategies based on their short-term interests, then the collective action problem dictates that the outcomes of individual decisions will be collectively inefficient in the absence of mechanisms to integrate decisions across policies and jurisdictions.

Via its mitigating mechanisms, the ICA framework tries to equip policy makers to address the dillemas of populist decision making and governance. These mechanisms aim to integrate decisions across policies and jurisdictions providing "the greatest gain for the least cost under different conditions of collaboration risk, as determined by the nature of the underlying institutional colective action problem, the compositions of affected jurisdictions, and institutional contexts". (Feiock, 2013: 397).

The Ecology of Games Framework by Lubell (2013) delivers a theoretical framework for analyzing institutional complexity affecting governance. The EG framework offers empirically testable hypotheses about the structure and function of complex adaptive governance systems. It also helps the analysis of the causal processes driving individual behavior and institutional change. In Lubell's view, policy analysis that focuses only on narrow slices of the complex system tends to jeopardise understanding, prediction, and recommendation. To address this challenge the EG framework adopts a realistic model of human decision making drawn from biological and cultural evolution. The model identifies how behavioral, social, and cognitive processes constrain rational choice. The initial version of the EG showed the potential to contribute with new insights to the study of governance, simultaneously considering three core processes of governance: cooperation, distribution, and learning. One of its innovative aspects was attention to how actors learn about the solutions, or how political power shapes the distribution of income.

The EG framework relies on six interrelated concepts: policy games, policy issues, policy actors, policy institutions, policy systems, and time, with concepts being transferable to any substantive policy domain. Policy games are defined by the group of policy actors, policy institutions, and policy issues that perform in a geographically defined policy system and who jointly participate and make decisions according to the collective choice rules of a specific policy institution. A game occurs when actors are making collective decisions subject to a specific set of institutional rules. In real situations, populist policy making will need to consider many different actors, policy institutions, and policy issues operating simultaneously and at different scales within a single geographically defined system. The strategic structure of these collective action problems such as an withdrawal of the EU, as proposed by pro Brexit and pro Grexit policy are the same as in traditional game theory. Payoffs from decisions with an impact on national resources are interdependent and where actors ignore the social costs of their decisions, equilibrium outcomes may be inefficient.

Lubell (2013:541) adverted that "depending on the nature of the issue, the strategic structure and payoffs of the collective action problem might be represented by a prisoner's dilemma, coordination

[i] http://blogs.lse.ac.uk/brexit/2017/11/08/the-internal-contradictions-of-the-brexit-project-are-unbridgeable/

game, or other type of game with a disjuncture between individual and social preferences". Policy actors such as populist leaders or their parties elected officials have some interest in the outcomes of decisions made in policy institutions and the resulting operational rules governing specific issues. The EG framework therefore contributes with an awareness of the need to scrutinise multiple policy institutions at the same time, viewing governance as a multifaceted adaptive system. The EG framework can be of great value to policy making analysts as a synthetic approach integrating ideas from different policy, social science, and systems theories.

The *Policy Regime Perspective* (PRP) can assist populist policy making analysts to reflect on "the role of policies as governing instruments and to consider more fully the factors that shape their political impacts". (May and Jochim, 2013:426) The PRP is an analytical lens that can support the construction of conceptual maps considering the collection of ideas, institutional arrangements, and interests that are involved in addressing policy problems. The regime perspectives can enable an assessment of populist policies as to how and with what effect policies trigger feedback processes that shape policy legitimacy, coherence, and durability. Together, these provide new insights into policy implementation and the interplay of policy and politics in governing.

According to the PRP framework, the outline of a proposed government policy direction can be depicted with respect to the collection of the three forces that encompass a regime: ideas, institutional arrangements, and interests.

a) *Ideas* are considered in this model as "the Glue of a Policy Regime" (May, Ashley & Jochim 2013:434). Ideas such as "UK must take back control", "we want our country back", "UK economy is a powerhouse" (Brexit, UK), "we want an European New Deal" (Syriza, Greece), "It is time to be demanding" and "Change the Future: defense of employment and Social Justice" (Bloco de Esquerda, Portugal), side by side with ideas like "affordable care," "economic security", and "zero tolerance," can be relevant to shape a common understanding of policy purpose (May, Ashley & Jochim 2013:435). These ideas work as the foundations for dialogue and argument about political pledges and as integrative forces for a new policy regime. Analysis of policy ideas in the PRP framework entail questions regarding the core idea of a regime, the kind of support these ideas have of main participants, how eloquent they are, and if political leaders, and interest groups echo these notions.
b) *Institutional Arrangements* analysis refers to the extent to which policy making rely on structure-induced cohesion. This aspect can be assessed with attention to institutional arrangements that shoud give an insight into the structure authority, attention, information flows, and relationships in addressing policy problems. The institutional design may rely on various mechanisms for addressing institutional collective action problems such as coordinating authorities, intergovernmental and other partnerships, networks of private and public entities, and contractual relationship. Populist policy making analysts need to capture both formal and informal aspects of a policy regime looking at power relationships and bureaucratic barriers of the institutional arrangements in support of a policy. However, institutional arrangements in populist policy making may hardly induce cohesion. It is more likely that populist institutional design will channel attention, information, and organizational relationships in support of the exclusion of sectors of society in acordance to divisive policy goals.
c) *I*nterests: an analysis of the governing capacty of a new policy regime must also refer interests and new coalitions of political actors. A basic issue in characterizing a populist policy regime is illustrating the source and degree of interest support for and opposition to the relevant policies after policy presentation. To analyse the sources of support one needs to assess the affected beneficiaries. Relevant stakeholders may or may not have the same sense of urgency and the same degree of acceptance to the purpose of a policy regime. For example, differently from Greece, 2011-2012, in Portugal, the Bloco de Esquerda policies in the 2011 elections supported disobedience against European policies to respond the debt crisis. Yet in Portugal the disobedience policy did not get the same support and interest as

they did in Greece in response to Syriza's electoral pledges. Policy feedback experience can "lead to interest-based backlash that dissipates or destroys the energy behind a regime" (May, Ashley & Jochim 2013: 436)

The Robustness Framework model can assist policy analysts eager to explore "how different possible policy processes might function in a dynamic policy context" (Anderies and Janssen, 2013:522). Both the Robustness (capacity of a system to of cope with uncertainty and change) and SES (socio-ecological system) frameworks can contribute to a collection of essential tools for public policy and governance for complexity and change. These two frameworks deliver a platform for interdisciplinary research that focuses on system-wide outcomes of the policy process beyond policy change. The theory behind the model proposes that the interconnectedness of human activities has consequences for the policy process to such an extent that policy analysts can no longer treat the policy context as fixed on the time scale in which the policy process evolves. One needs to take into consideration the dynamic feedback between policy and the context.

Anderies and Janssen (2013) have argued that the main lesson from applying the Robustness Framework is the notion that one can cope with uncertainty and change. Developing policies to increase robustness of SESs requires an explicit decision about robustness of what system properties and aspects of performance to what types of exogenous shocks. Policy makers are called to make choices about which vulnerabilities are to be addressed as "building robustness requires navigating trade-offs between short-term efficiency and long-term robustness" (Anderies and Janssen, 2013:517). In this model, policies are experiments that require systematic, ongoing monitoring and evaluation as elements of regulatory feedback networks. One solution for robust policies is decentralized experimentation that can allow for innovation and increase the probability of achieving a fit between policies and local conditions. A plan for governance at higher levels may stimulate a process of information exchange to facilitate learning from local-level experimentation.

The robustness theory suggests that a robust SES "may exist in the form of a polycentric system where higher levels provide coordination, monitoring, and synthesis, but hold local level units accountable to reach certain policy outcomes" (Anderies and Janssen, 2013:532)

The Collective Learning Framework (CLF) advocates that inquests into public policy processes need to consider the aspect of learning among policy actors. Such learning can shape whether and how actors come to agreement around their understanding of policy problems. Such model can help an understanding of policy making by populist forces such as Podemos in Spain. The policy learning process in Spain started at the end of 2010, when young cyber activists concerned about the crisis in Spain, initiated a spontaneous political platform in Facebook (Platform for the Coordination of Groups for a Civil Mobilization). This platform soon attracted a wide range of new and more established socio-economic protest groups. A first call for a demonstration on the 15 May 2011 came about and – the "Real Democracy Now"[i] attracted thousands of people who gathered in many cities of Spain. The 15M, a self-created movement, acused "political and economic powers for their precarious situation and demanded change".[ii] The principles followed by the 15M, such as respect, horizontality, transversality, diversity, debate, consensus, feminism, inclusivity, solidarity, cooperation and construction of the common welfare."[iii] opened the way for a new collective language that the *Democracia Real Now* developed following a new formula of organic voluntary accumulation of individual citizens' grievances.

The Collective Learning Framework can promote a coherente analysis of policy making in the PODEMOS Manifesto- We Want, We Know, We Can: A Program to Change Our Country, prepared for the General Elections of December 2015. The program articulated the voices of experts and the people committed to Spain. More than ten thousand people had contributed with ideas to the PODEMOS Platform by means of digital participation. The PODEMOS program also resulted from

[i] http://www.democraciarealya.es/quienes-somos/
[ii] Ibid.
[iii] Ibid.

more that three thousand programatic assemblies. The program proposed a route able to save the case of five million unemployed in Spain, to address precareity, exploitation, low salaries and energetic dependence. It was a proposal that would guarantee workers rights, the rights to political equality, public and free education, and fair fiscal policies, among others. There never existed precendents in Spain of such participative process in the elaboration of a party program.

According to the collective learning framework highlights the linkages between the products of learning and the processes, in the hope that scholars will develop more valid measures of policy learning. The elements of the learning process include the information acquisition, translation, and dissemination phases of learning. The framework supports studies of how individual learning processes relate to and interact with collective learning. It also helps identifying categories of factors such as structure, social dynamics, technological, functional and exogenous factors that may constrain or promote learning across a variety of policy contexts.

Lastly, the *Narrative Policy Framework* (NPF), by Shanahan et al (2011), helps policy makers to recognize that there are well-established and critical factors that influence the policy process such as resources, institutions, rules, and governing coalitions but policy narratives represent a missing class of variables in the dominant policy process theories. These theories operate at three levels of analysis (micro, meso, and macro). At the micro level, NPF is is concerned with how policy narratives shape and interact with public opinion (Jones & McBeth, 2010, p. 343). The use of collective heroes and anti-heroes in policy narratives can be powerful in shaping opinion about Euroscepticism and immigration, as seen in several examples of populist proposals in Western Europe. Policy narrative structure was found to influence individual policy beliefs (Shanahan et al., 2011) and shapes how individuals cognitively organize policy relevant information (Jones & Song, 2011).

Policy narratives can also be studied at the meso-level with focus on the strategic construction of coalitional policy narratives. Attention will be directed to connections with winning and losing narratives in the policy arena by means of quantitative content analysis. The advantage of conducting research at the meso level is twofold. First, the codebook is well developed and has demonstrated reliability. Second, policy narratives are found in public consumption documents that are readily available at no cost to researchers. The disadvantage of meso-level NPF work to date is that coding narratives is very labor and time intensive. At the broadest level—the macro level—NPF theorizes that the policy narratives of institutions and cultures play an important role in shaping policy processes and outcomes over substantial periods of time.

NPF elaborates on the component parts of the policy narrative: narrative elements, narrative strategies, and policy beliefs. Narrative elements are the distinctively narrative structures of a story that support the policy preference such as economic policies by the European Union are to blame the economic crisis and unpayable debt in the Eurozone. Narrative strategies such as the demonization of the elites in opposition to the pure "people" are the tactical portrayal and use of narrative elements to manipulate involvement in the policy arena.

Policy beliefs in political autonomy voiced through the slogan of 2016, about the need to "take back control" were intoxicating words that took centre stage in the EU referendum and won the vote for the Brexiteers. As UKIP Migration spokesman Steven Woolfe MEP stressed it was time "we take back control of our borders and who comes into our country" (UKIP News)[i] These beliefs in support of BREXIT were analogous to the moral compass embedded within the narrative as beliefs voiced by the Bloco de Esquerda in 2011: "the choices to be made by the Portuguese people on the *5th of June are between succumbing to an IMF programme of recession and unemployment or the promise of a road towards growth and social justice"(Bloco de Esquerda Manifesto, 2011- Change the Future : for employment and social justice, p. 1).*

NPF identifies distinct narrative elements associated with policy narratives include a plot, a causal mechanism, a solution, evidence, and characters. Looking at populist parties' narratives in Wester

[i] http://www.ukip.org/_time_we_took_back_control_of_our_borders_and_who_comes_into_our_country

Europe it is possible to identify broad categories of plots- stories of decline (related to high immigration intake by countries whose security and welfare systems are under pressure) and stories of control (national sovereignty can only be recovered by national parliaments taking back control from the European Union). The plot of control has been used by right-wing and left-wing populist parties alike to establish that security, welfare and social justice, once believed to be out of control could be within reach.

According to the NPF theory policy narratives indicate the source of the problem, which can be intentional, mechanical, inadvertent, and accidental. In 2011, the Bloco de Esquerda indicated the source of uncontrolled external debt to European financial speculators, as follows: "The fierce conditions imposed [by the EU] on Greece, Ireland and Portugal are driving those countries to a delayed tragedy. The spiral to this abyss can only be avoided via a rigorous negotiation. The BE proposes a renegotiation establishing new deadlines, new interest taxes and reasonable conditions for compliance that follow economic recovery and that cancel external debt". (Bloco de Esquerda Manifesto, 2011, page 2). Financial especulators, bankers and EU bureaucrats were actors who purposefully caused harm their benefit

5. Conclusion

The Narrative Policy Framework studied by Shanahan et al (2013) is of interest to investigate policy narratives elaborated by parties and interest groups portraying themselves as losing on an issue (e.g. loss of national sovereignty, . Policy proposals by right-wing populist parties in Western Europe engage in narrative strategies with the purpose to expand the scope of conflict against the interference of the European Union in national affairs, the dangers attached to immigration, and the Islamisation of their national cultures. Left wing populist parties on the other hand expand the scope of conflict againt the European troika, the tripartite committee led by the European Commission with the European Central Bank and the International Monetary Fund, that organised loans to the governments of Greece, Ireland, Portugal, and Cyprus.

Amongst the great variety of narrative strategies, the distribution of costs and benefits among the characters of the policy narrative seems to be the most efficient either in the right-wing or left-wing populist camps. Looking at the case of the Bloco de Esquerda Manifesto in 2011, the party was not able to diffuse the costs of losing the institutional support of the European Union and concentrate the benefits of its radical positions regarding Portugal's debt, aligned to Syriza's policies.

The Policy Regime Perspective (PRP) could have assisted the parties in question to construct conceptual maps considering institutional arrangements, and interests involved in addressing the debt crisis in Southren Europe. The regime perspectives could have enabled an assessment of populist policies as to the effect their policies would trigger. Looking at the Portugese case, in 2015 after the accomplishment of a three-year adjustment programme, the same four Portuguese parties that have dominated politics since democracy was restored in 1974 - the centre-left Socialist Party (PS), the centre-right Social Democratic Party (PSD), the conservative Popular Party (CDS-PP) and the Communist Party (PCP), continued to be the most popular parties. In the 2015 elections, most votes went to the PS, the PSD and the CDS-PP confirming the vote of confidence in the EU as the only way promote development, modernity and economic growth. Important to note that the Bloco de Esquerda adopted left-populist policies just for a short period. Post 2011, the BE embraced policy proposals based what is known as 'realpolitik' or practical and material factors rather than on theoretical or ethical objectives. The BE has never abandoned policies aligned with Feminism, Democratic socialism, Anti-capitalism, Euroscepticism, and Eco-socialism and it is arguable whether singular conditions will drive the BE back to support radical-left populist policies.

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