

Oliveira, R., Morgado, M.J., 2014. *Planning the Urban Food System of the Lisbon Metropolitan Area in Portugal. A conceptual framework*. In: Roggema, R. and Keeffe, G. (Edts) "Finding Places for Productive Cities. Proceedings of 6th International AESOP Sustainable Food Planning Conference, 5-7 November, Leeuwarden, The Netherlands. ISBN 978-90-822451-2-7

# **PLANNING THE URBAN FOOD SYSTEM OF THE LISBON METROPOLITAN AREA IN PORTUGAL. A CONCEPTUAL FRAMEWORK.**

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Track 1. Spatial design. Practical and innovative design examples, design theory applicable to productive landscapes in sustainable urban, peri-urban and rural environments.

## **Abstract**

The current global crisis and the acknowledgment that, in coming decades, the world population will be predominantly urban, brings about new necessities and demands for innovative approaches to food systems' planning. The need urges to identify the most efficient and consistent ways to deal with problems concerning economic and energetic efficiency, environmental quality, food security, job creation and urban development.

In the past few years, the international political and scientific agendas, strategies for food security in metropolitan areas, both in and out of Europe, highlight the need to re-localize production-consumption systems through more efficient shorter supply chains, as a means to promote sustainable urban development via place-based approaches. The provision of efficient responses to environmental, economic and social concerns, emerging in a context of complex global change, needs to be tackled at a local and regional level.

The study of Urban Food Systems becomes fundamental for an integrated approach to these internationally set priorities. However, this issue is yet to enter either on the Portuguese political or academic agendas. In Portugal, the structural changes that occurred on the food system in the last decades reflect an increased socioeconomic impoverishment of the countryside vis-a-vis urban areas. Consequently, there are deeper inequalities in terms of territorial cohesion. Moreover, in the Lisbon Metropolitan Area (LMA), where a third of the Portuguese population lives, the Utilized Agricultural Area represents 37% of the LMA, a figure which by itself justifies the need to adopt a strategic vision for the LMA's food system planning.

This paper will give insight to the conceptual definition of the functional region as the area where the LMA's food system might operate, providing orientation to the land-use management and strategic planning that should be able to promote its re-localization in a sustainable way, from a place-making stance. The characterization of the current LMA food system is seen as a starting point to understand how to develop a resilient urban food system based on adequate spatial

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planning concepts and tools. This paper seeks to discuss a feasible conceptual framework to design a sustainable solution to feed the Lisbon metropolis, while simultaneously promoting its economic vitality, environmental quality, spatial justice and cultural identity.

Key words: Urban food system, Urban food planning, Functional Region, Lisbon Metropolitan Area, Portugal.

## 1. Introduction

The current global crisis and the acknowledgment that, in coming decades, the world population will keep growing and will be predominantly urban, brings about new necessities and demands for innovative approaches to food systems' planning. Furthermore, changes in food diets, increasing food consumption and recent rising of food prices are putting food security at the center of political agenda and, at the same time, highlight the inefficiency of how we are dealing with food production, distribution and consumption (Godfray et al, 2010)<sup>1</sup>. The need urges to identify the most efficient and consistent ways to deal with problems concerning economic and energetic efficiency, environmental quality, job creation and urban development. A far greater issue is health concerns regarding food related chronic disease like obesity and diabetes, that are the main cause of death in Europe, and also because there is evidence that economic vulnerability comes side by side with problems of obesity and malnutrition, both coexisting with food insecurity, as the difficult access to food or to some types of food. These specific characteristics of food related disease incidence, emphasizes the need for an inter-sectoral thought and strategy at a medium to long term (Moragues-Faus et al, 2013).<sup>2</sup>

Even that, Europe doesn't face an immediate or pressing endangerment of food security comparing to other regions in the world, the European Food policy has been developed inextricably linked with the Common Agricultural Policy (CAP) and food production, and more recently with health policies and social aid programs. The coming CAP (2014-2020)<sup>3</sup> is thus a crucial moment, since it is an opportunity to establishing a holistic vision for the threefold main challenges that have been identified - economic, environmental and territorial; economic, including food security and globalization, a declining rate of productivity growth, price volatility, pressures on production costs due to high input prices and the deteriorating position of farmers in the food supply chain; environmental, relating to energy efficiency, soil and water quality, threats to habitats and

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<sup>1</sup> Godfray H.C.J., Crute I.R., Haddad I.; Lawrence D.; Muir J. F.; Nisbett N.; Pretty J; Robinson S.; Toulmin C.; Whiteley R. (2010). The future of the global food system. *Philosophical Transactions of the Royal Society. B* (365), pp. 2769 – 2777.

<sup>2</sup> Moragues-Faus A, Morgan K, Moschitz H, et al. (2013) Urban Food Strategies: the rough guide to sustainable food systems. *Document developed in the framework of the FP7 project FOODLINKS (GA No. 265287)*.

<sup>3</sup> European Commission (2013), Overview of CAP reform 2014-2020, Agricultural Policy Perspectives Brief, nº 5 December 2013

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biodiversity and climate change (UNCCCD, 2012)<sup>4</sup>; territorial, where rural areas are faced with demographic, economic and social risks, including depopulation and relocation of businesses, contrasting with worldwide mega-urbanization trends (UNFPA, 2008)<sup>5</sup>, due to what territorial cohesion is a policy that should also be closely related to agro-food policy (Foster and Escudero, 2014)<sup>6</sup>.

In the past few years, according to the international political and scientific agendas, strategies for food security in metropolitan areas, both in and out of Europe, highlight the need to re-localize production-consumption systems through more efficient shorter supply chains, as a means to promote sustainable urban development via place-based approaches. The provision of efficient responses to environmental, economic and social concerns, emerging in a context of complex global change, needs to be tackled at a local and regional level.

The study of Urban Food Systems becomes fundamental for an integrated approach to these internationally set of priorities. However, this issue is yet to enter either on the Portuguese political or academic agendas. The Lisbon Metropolitan Area (LMA), where a third of the Portuguese population lives and the Utilized Agricultural Area represents 37% of the LMA, is considered as a case-study when relating the results of the analysis and diagnosis of its urban food system and the conceptual framework to go further on the strategic planning process.

## 2. General conceptual framework

Over the last decades, radical change in the global food market supported by long distance transportation systems, refrigeration technology and industrial food processing has shifted the ways in which urbanites relate with food. They either take it for granted or relegate the food production and transformation to an abstract rural landscape, forgetting that food is one of the basic essentials for life, as it is the air, water and shelter, key issues for planners and urban designers (Morgan, 2009)<sup>7</sup>.

Nowadays, with the global changes resulting from mega-urbanization trend, world population growth, decrease in natural resources, land degradation and global warming with severe environmental and socio-economic impacts, urban food is likely a fundamental topic to be taken into consideration on theory, policy and practice towards agro-food policies and strategies of cities

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4 UNCCD (2012) "Zero net land Degradation ; A Sustainable Development Goal Rio+20, UNCCD Secretariat Policy Brief , 28p.

<sup>5</sup> UNFPA. (2008) State of the World Population 2007 Report. New York: United Nations Population Found.

<sup>6</sup> Forster T and Getz-Escudero A. (2014) City Regions as Landscapes for People, Food and Nature. , Washington, DC: Landscapes for People, Food and Nature Initiative.

<sup>7</sup> Morgan, K., 2009. Feeding the City: The Challenge of Urban Food Planning, International Planning Studies, 14(4), 341-348

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around the world (Marsden and Franklin, 2013)<sup>8</sup>. The food system relates to urban planning and territorial development at multiple levels: food and nutrition security, environmental sustainability, social justice, democracy, participation, human welfare, etc. Food is also central to resilience thinking (Walker and Salt, 2006<sup>9</sup>; Sonnino, 2009<sup>10</sup>) and sustainable place-making. All phases and stages of the urban food system (production, processing, distribution and consumption) may have a direct translation in spatial terms within the city and so they are prone to the creation of potentially sustainable places: productive urban and peri-urban allotments related with urban green system in continuity with green infrastructures, pedestrian and bike networks connected with food distribution and consumption circuits, farmers markets, new building typologies, etc.

Integrating the food system into urban planning implies that some urban land must be devoted to food production, taking advantage of all the eco-services that this component of the system, when properly located, could provide. This is especially relevant at a time of economical crisis and urban sprawl containment. Indeed, urban regeneration is a main European focus in urban planning after a decade of uncontrolled urban growth, especially in Southern Europe, and it is an important policy of the EU. Within this framework, urban agriculture, although maybe secondary in economical terms, appears as a relevant tool, since it is synergistically related with urban sustainability principles such as mix of uses, density, proximity, water and waste cycles, greening and liveability (EC, 2010)<sup>11</sup>. In addition to production functions, the urban food system offers a wide range of ecological functions (e.g., biodiversity, nutrient cycling, and climate regulation) and cultural functions (e.g., recreation, cultural heritage, and visual quality) that benefit the nearby community and society as a whole (Wascher, 2010)<sup>12</sup>.

Food production inside and around urban areas is able to foster social and economic sustainable development and at the same time promote environmental sustainable strategies, becoming the single most important urban 'enterprise' engaging directly with the concept of Urban Metabolism (Girardet, 1999)<sup>13</sup>, helping to close the waste-resource loop through the recycling of domestic waste and water (to be reintegrated in the soil as compost or as food for animals), by producing fuel, and by supplying local markets and reconnecting producers to consumers, reducing significantly the ecological footprint of food consumed in cities (Jarosz, 2008)<sup>14</sup>. The option for an urban food

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<sup>8</sup> Marsden, T., and Franklin, A. Replacing neoliberalism: theoretical implications of the rise of local food movements. *Local Environment*, 18(5), 636-641.

<sup>9</sup> Walker, B., & Salt, D., 2006. *Resilience thinking: sustaining ecosystems and people in a changing world*. Island Press.

<sup>10</sup> Sonnino R. (2009) *Feeding the City: Towards a New Research and Planning Agenda*. *International planning studies* 14: 425-435.

<sup>11</sup> European Commission, 2010. Toledo Informal Ministerial meeting on Urban Development Declaration.

12 Wascher, D.M., van Eupen, M., Mùcher, C.A. & Geijzenborffer, I.R. 2010a. Biodiversity of European agricultural landscapes; Enhancing a high nature value farmland indicator. Wageningen, Statutory Research Tasks Unit for Nature & the Environment, WOt working document 195. 88 p.; 26 Figs.; 1 Tab.; 33 Refs.; 6 Annexes.

<sup>13</sup> Girardet, H. (1999). *Creating Sustainable Cities*; Schumacher Society; Green Books, Dartington, UK.

<sup>14</sup> Jarosz, L. (2008). The city in the country: Growing alternative food networks in Metropolitan areas. *Journal of Rural Studies* 24, 231-244.

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system based mainly on ecological and organic production, on the use of renewable energies and on the climate regulation, CO<sup>2</sup>-sink and storing and urban heat island effect reduction potential of agriculture may be greatly reinforced if it is directly linked to the global strategies, goals and established commitments of the fight against climate change and with the related policies of the EU (EC, 2007)<sup>15</sup>.

A consideration of the scale, nature and purpose of different food production operations (from micro-scale backyard kitchen gardens inside the city to medium- and large scale operations located in its hinterland) will provide a thorough image of an UFS in all its complex socioeconomic and environmental dynamics. On the other hand, understanding urban and rural landscapes as a 'continuous landscape' will allow for a holistic understanding of the different factors and actors that shape landscapes and improve policies designed to connect the ecological structures of cities with their regional settings.

Based on this conceptual framework, we assume that a sustainable food system is one in which the food production chain (production, processing, distribution and trade to final consumption, and waste management) ensures, now and in the future, food and nutrition security in terms of quantity and quality, accessing food for all, while promoting a healthy environment, economic dynamism, social cohesion and public health. Emerging evidence shows that the planning of UFS is a complex issue with multiple environmental, social, political and economic determinants. It encompasses components of availability, access and utilization. A comprehensive and holistic analysis of how the current organization of food production, processing, distribution and consumption in MA requires a broader concept of a "food system" beyond specific activities, to include other economic, social, and environmental drivers as well as the interactions among these drivers, activities and outcomes (Ericksen, 2008)<sup>16</sup>.

Clearly, this complexity of an urban food system brings to bare a substantial pressure on existing planning public policy tools. First, urban food systems do not geographically comply with administrative boundaries. This non-coincidence may have high direct and indirect costs in terms of the inefficiency of institutional organization and logistics, use of resources, etc. Secondly, the urban food system raises an on-going and unsolved challenge in spatial development policies: the management of the urban-rural relationship (OECD, 2011)<sup>17</sup>. When considering existing interactions between urban areas and their hinterland, it is important to recognize "spatial linkages such as flows of people and goods, money and information, and other social interactions that are central to socioeconomic and cultural change" (Tacoli, 2006)<sup>18</sup>. Geographic socioeconomic divides that persist until this day to understand rural and urban environments as isolated systems, have

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<sup>15</sup> European Commission, 2007. Limiting Global Climate Change to 2 degrees Celsius - The way ahead for 2020 and beyond".

<sup>16</sup> Ericksen, P. J. (2008), Conceptualizing food systems for global environmental change research, *Global Environmental Change*, Volume 18, Issue 1, February 2008, Pages 234-245, ISSN 0959-3780, <http://dx.doi.org/10.1016/j.gloenvcha.2007.09.002>.

<sup>16</sup> (<http://www.sciencedirect.com/science/article/pii/S0959378007000659>)

<sup>17</sup> OECD, 2011. *Assessing and Monitoring Rural-Urban Linkages in Functional Regions: A methodological framework*. OECD, Paris.

<sup>18</sup> Tacoli, C., 2006. *The Earthscan Reader in Rural and Urban Linkages* IIED, London

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persistently resulted in ill-conceived policy and planning tools, hindering the "considerable potential role in regional and rural economic growth" (Tacoli, 2006).

### 3. The Urban Food System of the Lisbon Metropolitan Area

The Lisbon Metropolitan Area takes up a central place in the Portuguese mainland territory and consists of two different areas (NUT II), the Great Lisbon and the Península of Setúbal, separated by the Tagus estuary. With a total surface of 2.994 km<sup>2</sup>, the LMA includes 18 municipalities (NUTIII) (Fig.1). These municipalities correspond close to 3,3% of the national territory and its population of about 2,75 million residents, which is close to 30% of the Portuguese population.

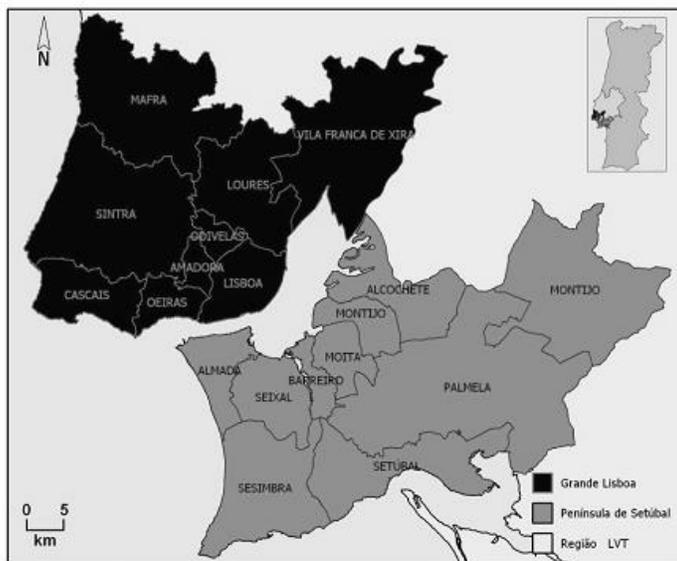


Fig. 1 - The LMA including the Great Lisbon and the Península of Setúbal with its 18 municipalities.

Considering the main biophysical characteristics, this metropolitan area is quite diverse with a moderate relief dominated by plan morphology and low altitude areas that constitute the extensive plain of the sedimentary basins of rivers Tagus and Sado.

Tagus estuary is the major wetland in Portugal and one of the most important ones in the European Atlantic Coast, with an area of 325 km<sup>2</sup> and a high statute for the conservation of habitats for important fauna and flora species.

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To the south of the LMA, Sado's estuary presents itself also as a quite rich wetland, both because of its' biodiversity as well as due to the landscape diversity including vast agriculture and forestry fields, fishery, extensive aquaculture and salt production fields, side-by-side with urban occupation and high natural and cultural value sites.

Concerning the statistics on land use in the LMA (PROT 2009), one of the most relevant territorial components for the Urban Food System (UFS), are built-up areas, the most expressive type of land use. The compact built-up areas (consolidated, organized and hierarchical urban structure) represent about 33,5% of the LMA's territory and the fragmented built-up areas (unplanned urban sprawl territories) correspond to nearly 18%, being related to urban uses and functions of the territory. These areas are located along the main urban axis of the north riverbank and close to the main urban centers on the south riverbank. Disperse built-up areas stand for 9% of the territory and are mainly located in areas where there is dominance of agricultural land-use. Empty spaces (none specific use) are 4,5%, roughly the the same as the industrial areas. Public infrastructures and equipment only represent only about 1% of the total area.

The identified forest areas (areas where forestry constitutes the main land-use) correspond to about 22% of the territory. Agricultural areas are the second most expressive land-use pattern in the metropolitan territory, taking up to 27% of the LMA. The wilderness areas include wetlands, marshes, bushes and dunes and, as a whole, they stand for 9,4% of the territory.

Since land use is a fundamental topic to the LMA food system characterization, another study has been developed based on Corine Land Cover (CLC, 2006) (Fig. 2). Looking at the percentage occupied by the main land use classes it is relevant to observe that the total agricultural and forest productive areas, in the sense of producing products and goods, are about 60%, contrasting with Urban areas with a total of 22%. Despite the generic scale of the used cartographic basis (1: 100 000) when related to statistical data, it becomes clear that food production and environmental services has a significant room on the UFS of LMA which likely emphasizes the rural character of certain areas within the metropolitan context, highlighting, at the same time, the need of its strategic planning towards a sustainable urban-rural development (Oliveira,2014)<sup>19</sup>.

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<sup>19</sup> Oliveira, R. et al, 2014. O Sistema Alimentar da Área Metropolitana de Lisboa. Análise e Diagnóstico. Relatório final do projeto ANATOLE. FCSH/UNL.

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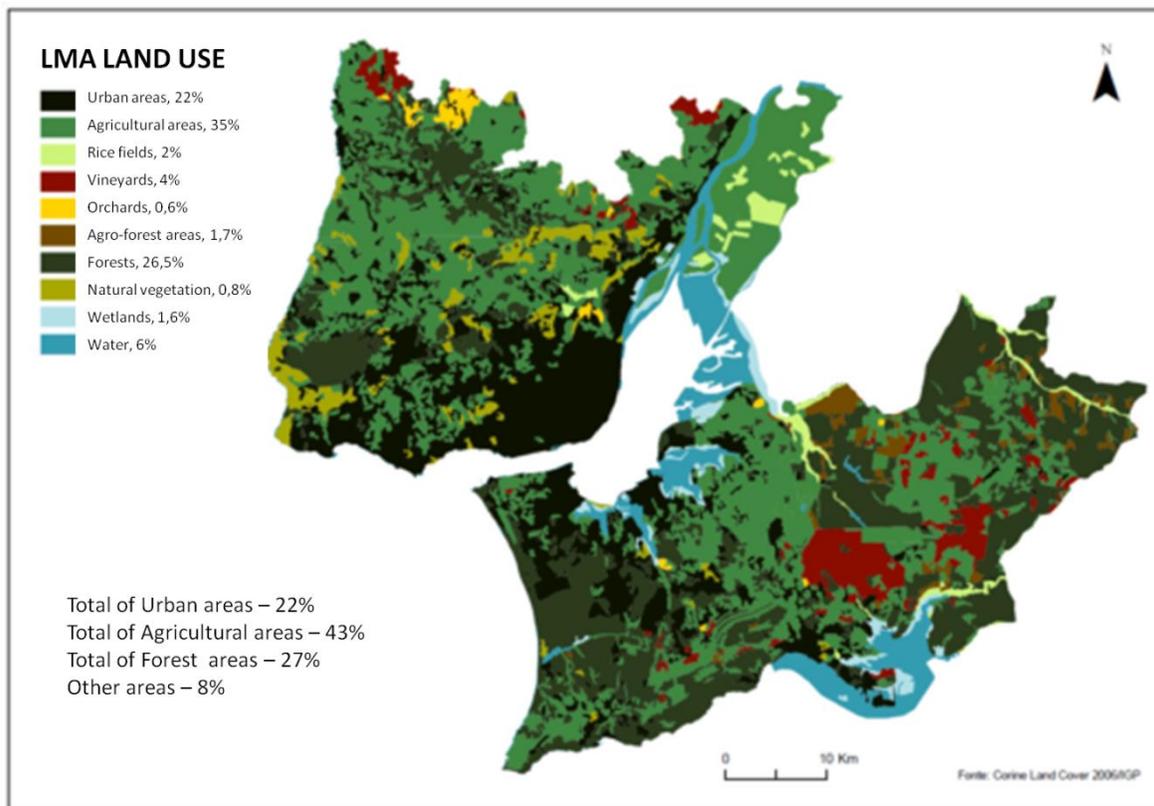


Fig. 2 - Land use of LMA based on Corine Land Cover (2006) and the total of area (%) occupied by its main classes.

Looking into other kind of indicators by analyzing the structure of the LMA food system we can identify some features that indicate the existing of an established functioning Urban Food System:

- i) LMA has a relatively dense network of 7.524 holdings, representing an utilized agricultural area of 87.588 ha and with an average utilized agricultural area of 11,6 ha, and 7.571 sole producers and societies;
- ii) The distribution network is also quite dense considering not only marketplaces and wholesale markets, but also food retailers, restaurants, catering and food processing industries (Food Systems' related activities can represent more than 13% of all the LMA's activities).

With 2.821.876 residents even not considering floating population such as tourism, students, workers, and so on, the potential market share is relevant.

These data points out that there is an Urban Food System in place and it has the potential to increase final and intermediate consumption of local produce with impacts on local economies and

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positive spillovers to rural areas thus contributing to increase territorial cohesion (Morgado and Oliveira 2012).<sup>20</sup>

The project has been addressed basically the literature review, the conceptual framework and a preliminary analysis and diagnosis of the UFS in the LMA. Also interviews with key stakeholders have already be applied. On the next phase it will undertake statistic and modulation quantitative analysis and GIS-based spatial analysis, integrating socio-economic and bio-physical models, reflecting prevailing factors driving supply and demand at different geographic scales and a broad scope of agricultural products. As output a set of indicators and analytic tools will be created in order to integrate a strategic perspective for the UFS of the LMA in the regional and local spatial planning system, not necessarily as a formal spatial plan rather as a set of orientations that might be adopted by different stakeholders from a governance point of view. The project conceptual framework is mostly based on four concepts that have been considered as relevant.

## **4. Relevant concepts for the LMA food system planning**

Food and nutrition security and sustainability are core societal challenges for the XXI century that have yet to gain the necessary centrality in political, policy and academic agendas worldwide (Lundquist, 2010)<sup>21</sup>. Consequently, the debate on how to deliver resilient urban food systems is of paramount importance through the design of adequate spatial planning and governance instruments. Our research uses four concepts as the basis for the development of a new conceptual framework: A. Functional Regions (FR), B. Functional Economic Market Area (FEMA), C. Short Food Supply Chains (SFSC) and D. Green infrastructure (GI) (Espón, 2007<sup>22</sup>, OECD, 2002<sup>23</sup>).

### **A. Functional Regions**

Functional Regions are sub-regional spatial units, non-overlapping with political-administrative boundaries and with relevant levels of internal interdependence. Functional regions are ideal units to implement and manage urban food systems, but their use as policy tools brings along several challenges. Some are quite tangible, such as those related to policy integration processes (i.e., the link with existing planning and development instruments). Others are deeply rooted in national institutional set-ups and political cultures. Our challenges is to explore the scope for achieving an

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<sup>21</sup> Lundqvist, J. (2010). Producing more or wasting less? Bracing the food security challenge of unpredictable rainfall. In Martínez-Cortina, Garrido, A; Botin, M; López- -Gunn, E. (ed.) *Re-thinking Water and Food Security.*, London, UK, Taylor & Francis Group, pp.75-92.

<sup>22</sup> ESPON, 2007. Project 1.4.3 Study on Urban Functions, Final Report.

<sup>23</sup> OECD, 2002. *Redefining Territories: The Functional Regions*, OECD

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enhanced level of territorial coordination, cooperation and partnership as well as flexible and multilevel forms of territorial governance (Born and Purcell, 2006)<sup>24</sup>.

## B. Functional Economic Market Area

Following a functionalist perspective, we will propose to consider the urban food system in a context of an Urban Functional Economic Market Area (FEMA) defined on the basis of a set of markets or catchment areas, with relevant levels of internal interdependency, which best reflect the drivers of a local food economy. FEMA's are not easily defined. Economic flows frequently are not coincident, with administrative boundaries surpassing them or forming sub-regions or city regions instead. By studying the FEMA in LMA, we will identify the main economic drivers of food system activities; we will gather data on the supply and the demand side that accurately reflect economic flows and internal interdependencies which clearly define a food system as a FEMA, identifying the policy implications of the main drivers. This information will be useful to define orientations for future policy design, responding to calls for increased cooperation and policy coordination to maximize policy impact and efficiency (Gerritsen, 2013)<sup>25</sup>. On the other hand in the case of the LMA, a peripheral metropolitan area in Europe, it is relevant to consider economic resilience at a regional scale.

Regional economic resilience might be conceptualized as the ability of a region (defined roughly as a metropolitan area) to recover successfully from shocks to its' economy that throw it off its growth path, or at least have the potential to do so, either by returning to the previous equilibrium situation in terms of growth rate of production, employment and/or population, by resisting the shock altogether, or by restructuring its' economy in order to generate a new state of equilibrium (Pendall, Foster and Cowell, 2007)<sup>26</sup>. The above mentioned shocks might result of one or a combination of factors (a) *structural change* resulting from global or domestic competition, from changes in the region's competitive advantage for various products, and/or from changes in consumer demand for products the region produces, or from (b) other external shocks (a natural disaster, closure of a military base, movement of an important firm out of the area, etc.) (Hill, Wial and Wolman, 2008)<sup>27</sup>. Still according to Pendall, Foster and Cowell (2007), Regional Resilience might be seen as a region's ability to avoid getting locked-in a sub-optimal structural equilibrium status, resulting from a set of historically made decisions as in path-dependency processes.

The approach of resilience in terms of systems and long term processes becomes even more important when speaking about Urban Food Systems and food based functional regions. A long

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<sup>24</sup> Born, B., & Purcell, M., 2006. Avoiding the local trap scale and food systems in planning research. *Journal of Planning Education and Research*, 26(2), 195-207.

<sup>25</sup> Gerritsen, A.L. Plug, R., Kranendonk, R.P., Lagendijk, A. (2013). *Metropolitan Food Clusters: The Strategic Capacity of Regional Economic Clusters*. TCI conference 2013: Designing the future - Innovation through strategic partnerships, Kolding, Denmark.

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term systemic perspective of regional resilience would emphasize the structure of relationships among the variables in the system, that persists over a long period of time and the economic, political, and social institutions that condition this structure. Economists usually refer to these long term (50 year or more) sets of relationships among variables and institutions as "Social Structures of Accumulation" (combinations of mutually reinforcing economic, political, and social institutions that persist for long periods of time and create the conditions for long-term economic growth) explaining the evolution of macroeconomic performance (Reich, 1997)<sup>28</sup>. These structural arrangements tend to go through a process of thriving, stabilizing and decaying over long periods of time. Resilience would therefore be the ability of a region to adapt and rearrange its' combinations of economic, political and social institutions in order to avoid the decaying process that might jeopardize growth, development and cohesion processes (Hill 2008<sup>29</sup>, Hassink 2010<sup>30</sup>, Simmie 2010<sup>31</sup>).

Thus, the Urban Food system's planning is a powerful instrument to increase Regional resilience, guaranteeing food security to urban populations, even under stressful conditions, as well as economic, environmental and social sustainability.

### **C. Short Food Supply Chains**

While the FEMA relies on an economy of proximity approach, the concept of Short Food Supply Chains (SFSC) might play an important social role in enhancing the vitality and quality of life in both urban and rural areas, given its focus on inclusive social change through education and ethical issues. There are however a few examples where SFSC's have been seen to be associated with social exclusion as an excess of localism, focus on wealthy consumers (Morgan and Sonnino, 2010)<sup>32</sup>.

Economically, there is evidence that local farming systems and short chains do have a higher multiplier effect on local economies than long chains and contribute to local employment, particularly in rural areas. At the producer and farm level, they seem to allow a higher share of value added to be retained locally, although quantitative evidence of such impacts is poorly documented. There are many examples of farmers using a mix of SFSC's, or combining them with longer chains in order to build resilient routes to market and reduce risks from market volatility.

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<sup>32</sup> Morgan K and Sonnino R. (2010) The urban foodscape: world cities and the new food equation. Cambridge Journal of Regions, Economy and Society 3: 209-224.

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In order to better understand the economic relevance of food systems' activities it is important to consider that it is usually approached on trade value of the related goods and services and the weight on regional wealth creation, production, employment and competitiveness. Nevertheless, the food system's economic relevance goes far beyond.

(i) Social inequalities - The weight of food expenditures on family income.

Urban populations in the USA spend something within the range of 10% to 40% of their income on food depending on their economic status, and in developing countries food consumption might even take up to 85% of total income (Sonnino, 2009).

In Portugal, in the Metropolitan Area of Lisbon, Food consumption represents, in 2010/11, an average 12,5% of total families' expenditures and 9,3% of the families' income, and expenditures in Hotels, restaurants, catering and similar represent 10,8% of total expenditures, 8,8% of income (INE, Inquérito às Despesas das Famílias). However these average numbers may hide the existence of deep inequalities among low income and high income families. The occurrence of external shocks with relevant impacts on food prices reflects immediately on the expenditures structure of families with greater impact on food security among low income families with no disposable income for adjustments.

Most studies demonstrate that urban agriculture contributes to sustain food security levels ensuring a more regular supply of food for low income urbanites mostly ignored by long food chains. (Sonnino, 2009). Nevertheless it is so not only for low income urbanites. Considering that the consumption trends are shifting more and more towards high value added food stuffs from the food processing industry, and in a context of little or no rural connections or direct access to food production, urban residents are highly dependent on global food systems and global markets, being strongly affected in situations of food shortages and becoming rapidly in a position of unsustainable food insecurity and even hunger. Even the smallest decrease of urban dependency on global food systems, contributes to regional resilience insuring a greater proportion of locally added value productions, less vulnerable to external shocks.

iii) Economic sustainability of food systems activities

If the organization of the urban food system is in such a way that it promotes an increase of just a few percent of locally added value activities in response to the shifts in consumption trends, and consumers concerns, such as ethic considerations about environmental responsibility and local producers' support and fair trade, or the supply of food related services such as online shopping and door-to-door delivery, and the development of innovative distribution channels and market niches such as gourmet or bio, branding and innovation, and even the association of food production activities to other ecosystem services such as landscape preservation, biodiversity or leisure, it contributes to activity diversification and multi-functionality thus increasing the systems' resilience to external shocks.

iv) Urban-Rural partnerships and Territorial-cohesion

The potential to increase the local market share of local food system's activities depends largely on the capacity to respond to local demand, insuring stability of supply and diversity of products offered. Even if urban agriculture might represent an important contribution for guaranteeing food

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security for low income urbanites, it does not suffice to a relevant increase in the dynamics of the proximity economy. Nevertheless, some things are common to every urban center.

When talking about urban centers sometimes with a fast growing population the concept of proximity needs to be adjusted to the spatial context of each urban center.

Land availability for agricultural or industrial uses for food processing units is scarce within urban-centers pushing these activities towards peri-urban areas. This spatial reconfiguration of the food systems' activities may determine the configuration of eventual Urban-Rural partnerships, established under the assumption that trade of food is an important source of money transference between urban centers (consumers of food-high demand scale) and peri-urban rural areas Food production and processing (need for supply-scale); Territorialized food systems, while increasing money transference among rural and urban areas within the Metropolitan Area has the potential to decisively contribute to territorial cohesion (Albergaria, H. et al 2012).

Usually functional regions, and functional economic market areas are defined through the labor market flows and its' self-containing area established from the commuting area or travel to work, shopping or cultural activities. (OECD, 2011<sup>33</sup>)

The identification of such functional areas consists on a sequence of three steps (Brezzi et al<sup>34</sup>).

- i) Identifying one or more urban cores according to population density in built-up areas (densely inhabited areas).
- ii) The second step aggregates the non contiguous cores, belonging to the same polycentric functional area on the basis of the strength of commuting flows.
- iii) The third step is to identify the hinterland or "worker catchment area" of the urban labor market outside the densely inhabited core.

## **D. Green infrastructure**

Based on the widely perceived need of combining economical efficiency and environmental quality, the importance of green infrastructures in urban planning and development is being recognized by the European Commission. In the communication of the European Commission (2013)<sup>35</sup> "Green Infrastructure – Enhancing Europe's Capital Natural", there is an explicit call for the inclusion of this "strategically planned network of natural and semi-natural areas" in the spatial planning and territorial development policies. GI and the UFS are closely related through the fact that it is necessary to maintain productive agricultural land on the urban fringe and to integrate food production in urban areas.

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<sup>35</sup> Comissão Europeia, 2013. Infraestrutura Verde – Valorizar o Capital Natural da Europa. COM (2013) 249 final, 6.5.2013. Comissão Europeia, Bruxelas. 12 pp.

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The GI promotes the multifunctionality of landscape, which means performing various functions, that are related or not in the same space, in the same period of time or in alternating periods, and which provide a high number of beneficial services for the human well being.

Landscape functions and services become an important concept in policy making because they help to decide what the best land uses for a particular location are, according to the needs of different stakeholders. Thus, for the definition of an urban food system in MA we consider essential analyzing the GI of this area, based on the concept of landscape multifunctionality and ecosystem services (MEA, 2003)<sup>36</sup>. Ecosystem services can be defined as the ecological functions that provide human benefits (direct or indirect) as food, wood and consisting of a number of interrelated biotic and abiotic processes. They are important for human wellbeing, sociocultural cohesion and economic activities. If the urban food system is efficiently planned and managed, it can support the different ecosystem services, such production of food and fiber, biodiversity conservation, soil conservation, water regulation and recreation, among others (Wascher et al, 2010)<sup>37</sup>.

The identification and characterization of the services and their valuation is one of the points that we want do address on this research. For the valuation of eco-services provided by urban food system we will take into account the three types of valuation: ecological, economic and socio-cultural.

## 5. Conclusion

The upcoming of urban food planning strategies that arise all over the world, place this subject on both the European and international urban policy agendas. There are numerous examples of Urban Food Strategies that since 2009 have become important tools for urban development, such as New York, Toronto, Vancouver, Paris, Amsterdam, Tokyo, Belo Horizonte, London, and also a wide network of cities in the United Kingdom, amongst many others.

In Portugal, although there is not an agro-food planning strategy, we can identify in the most recent few years the advent of various initiatives that highlight the rising interest and entrepreneurship on behalf of public and private institutions, in order to increase the dynamics of production, distribution and consumption sectors, with special emphasis on initiatives in the LMAs' influence region.

These trends indicate that we are reaching the necessary level of information availability, critical mass, and technical abilities that allow for the establishment of urban development processes intrinsically linked to urban planning processes, holding the Food System as an object of urban planning and spatial management.

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<sup>36</sup> MEA, 2003. Ecosystem and Humam Well-Being: Framework for Assessment. Island Press, Washington DC. 245 pp.

<sup>37</sup> Wascher, D.M., van Eupen, M., Mücher, C.A. & Geijendorffer, I.R. (2010). Biodiversity of European agricultural landscapes; Enhancing a high nature value farmland indicator. Wageningen, Statutory Research Tasks Unit for Nature & the Environment, WOt working document 195. 88 p.; 26 Figs.; 1 Tab.; 33 Refs.; 6 Annexes.

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The need for this kind of processes assumes particular relevance when we take into consideration that the national food balance exhibits a strong foreign dependence and growing on account that the Gross Added Value from Agricultural, animal husbandry, hunting, forest and fishery has decayed in 2012 of 2,1%. On the other hand when analyzing the territorial dynamic, mainly based on 2011 Census, we can see that, in close to 78% of the Portuguese mainland's territory, it is low or even very low, despite favorable physical conditions for agricultural production and also the accessibility grids that insure food distribution (Oliveira et al, 2012)<sup>38</sup>.

This scenario at national level reflects, in a way, at the metropolitan scale, where close to a third of the national population resides, an Agricultural Utilized Area that accounts for about 37% of the territory and a combined agricultural plus forestry use area that represents more than 50% of the total area. Despite those conditions, in 2012, the Contribution of Agriculture, Animal husbandry, Hunt, forestry, and fishery for the Grosse Value Added in the LMA is quite low (0,4%) due to the values verified in the NUT level III of Great Lisbon (0,2%) e of Setúbal Peninsula (1,6%) slightly higher but, even though, under the mainland's average.

Therefore, we think there is a high potential that justifies the Urban Food System Planning in the MAL, not forsaking the interest and urgency of performing this same exercise for other metropolitan areas and middle size urban centers, and even assuming a national scope approach. A challenge such as this, should be considered as an applied research programme, involving a network of active partnerships including the academy, governmental and non-governmental organizations, and where the role of the MAL and of the municipalities as local governments' institutions, stands out as crucial.

This research has been carried out under a project<sup>39</sup> that allowed to analyze the main characteristics of the UFS in the LMA and the conceptual framework for its strategic planning. Another research project is now being set up that also seeks (i) to contribute to a key issue of the emergent international and EU scientific agendas; (ii) to contribute to the objectives of the Europe 2020 strategy and related policies established for 2014-2020; (iii) to raise awareness in the Portuguese political agenda to the relevance of food sustainability through the concept of Urban Food System as a factor of territorial cohesion, thus informing policy-making at national, regional and local level; (iv) to tap into different disciplinary and analytic domains with few linkages so far in a common thematic, interdisciplinary issue; (v) to enlarge the mainstream concept of Food System through a more comprehensive approach: a Local Productive System that, besides being an important economic system, is also a social, cultural and environmental system that takes place in specific political and strategic frames, both nationally and internationally; (vi) to collect, systematize and make available relevant information for the definition of a functional, resilient food region in the LMA and the design of an Urban Food Strategy for this city-region; (vii) to set up and mobilize a panel of international experts to support not only the current proposed research but also a follow-up application to EU-wide funding in order to complete the objectives that fall outside the narrower focus of the current proposal.

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<sup>38</sup> Oliveira, R., Tomé, R., Grave, L., Maurício, I., 2012. O papel das redes de base ecológica na coesão territorial em Portugal. IX Colóquio Ibérico de Estudos Rurais. (I)Mobilidades e (Des)Envolvimentos: o Rural Desafiado. Lisboa.

<sup>39</sup> ANATOLE (Atlantic Network Abilities for Towns to Organize Local Economy)

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