Modeling Municipal Heritage Management: The example of Oliveira de Azeméis, Portugal

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ABSTRACT

The resources that medium-sized municipalities allocate in the process of both creating and maintaining instruments for heritage management have grown over recent decades. There are first and foremost legal reasons for this, as European national laws have come to reflect societal concerns regarding the preservation and commodification of the past. Sustainable solutions may be achieved through the understanding of heritage assets, and their use in the support of responsible, data-driven choices. This paper analyzes a case of local tangible heritage administration in Oliveira de Azeméis, Portugal.

KEYWORDS

sustainable management; tangible heritage; archaeology; Portugal

Introduction

Portuguese heritage management structures reflect the nation's administrative organization, which differs significantly from many other European countries, such as neighboring Spain, as it lacks supra-municipal autonomous decision-making entities. Political regionalism is indeed non-existent in continental Portugal, and sporadic attempts to discuss it in the recent past were met with little enthusiasm. This reality directly affects the functional structure of the Directorate-General for Cultural Heritage (*Direção-Geral do Património Cultural* - DGPC), an entity tasked with conserving, preserving and inventorying national heritage. The institution also directly manages some major monuments and sites, and has regionally based staff that oversees, among other things, archaeological fieldwork, yet lacks full operational autonomy. In fact, even from a broader angle, most heritage-based activity, in terms of commodification and daily use, remains a local issue. It is true that, worldwide and in general terms, both the academic and the practical framework for municipal heritage administration are usually fairly broad, and engage communities more easily than ever before through the use of digital applications. Cultural heritage databases are nowadays a mainstream reality, and they find applications not only in everyday civic life, but also in sometimes extreme circumstances, such as conflict or disaster zones, or politically fragile regions (Isakhan 2015, Silver *et al.* 2016; Sheldrick and Zerbini 2017), with corresponding umbrella analyses, training efforts, and supranational collaboration (Fontal & Gómez-Redondo 2016; Chiabrando *et al.* 2018). National heritage agencies around the globe naturally rely on usable interfaces for their inventories too, although they rarely articulate electronically with other national entities. One may however find many good such examples in inconspicuously routine tools for local development, albeit less mediatized, with applications for matters of energy performance (Fabbri *et al.* 2012), seismic prevention (Milosevic *et al.* 2018), or hydraulic impacts (Lundy *et al.* 2018) interfering with historical built environments in a municipal context. This sort of coherent digitized register is achievable even at the neighborhood scale (Angel *et al.* 2017), from where heritage surveys can aid the creation of a macro-level strategy from the bottom up. The potential for municipal e-government practice is considerable (Batlle-Montserrat *et al.* 2014); namely, it can enable the delivery of more cohesive services for citizens' understanding of territorial realities.

Managing the cultural sustainability of local resources is therefore fundamental to enhancing participative citizenship. This concept is to be understood within a multidisciplinary scope, which fundamentally stems from permanent changes in urban growth (Pandit *et al.* 2012) and in the wider economic network (Farley 2012). The latter, in turn, looks to heritage for social cohesion (Karim 1997), and to forms of community-led digital commitment for the local – as opposed to the

national – identity (Mutibwa *et al.* 2018). Cultural sustainability in fact depends on some degree of activism, based not only on growth but also on ethics and equity (Mason and Turner 2020). But a combination of cultural, social, and economic contradictions makes it so that heritage sustainability is hard to define and therefore complex to plan. Barthel-Bouchier (2013) pointed out that, despite some enthusiastic, universal metanarratives on the advantages of sustainable heritage, namely in the tourism industry, in practice this remains a complex relationship. The case study below focuses on the municipality of Oliveira de Azeméis, in northern Portugal. It encloses an abundance of heritage resources, which are identified and managed through an integrated local development plan. This also encompasses intangible heritage, as well as movable objects; the current text centers on the articulation of built environment, archaeological sites, and cultural landscapes.
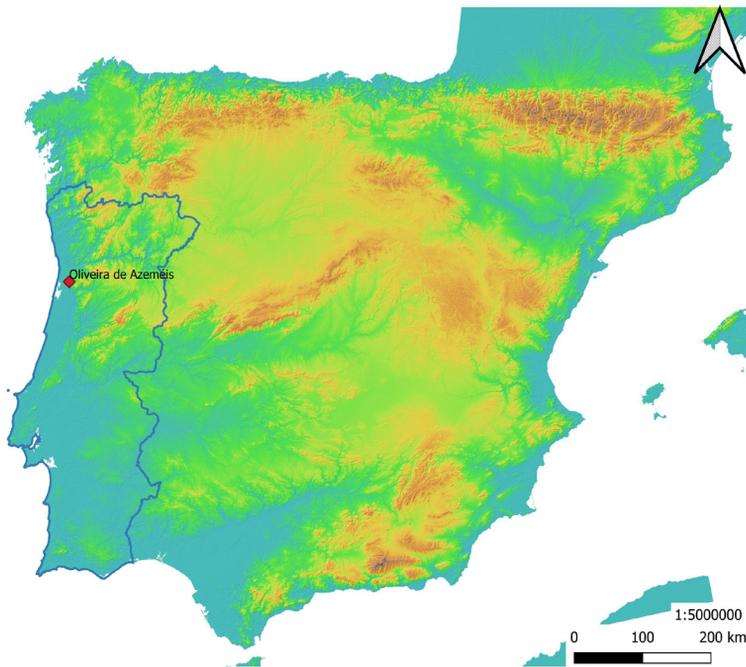
Fig. 1: Location of Oliveira de Azeméis.

Administrative context

As mentioned above, a major part of the responsibility for heritage management in Portugal falls to the local level, although this is largely dependent on procedural approvals and decisions by the DGPC in Lisbon. Such a state of affairs represents a diverse range of challenges for individual cities and towns that are demographically

and economically unique. As an example, Oliveira de Azeméis is a municipality of the Porto Metropolitan Area, covering an area of little more than 160 sq. km, and with a population of just under 70,000 (figure 1). Politically, a city councilor oversees the field of heritage, museums and archaeology, while an office of archaeology and museology deals with technical matters, including the systematization of data on local heritage. The primary level at which municipal heritage databases need to operate is not that of the technological potential; no digital platform is useful to a city council unless it builds on a clear legal groundwork. In the particular case of the Portuguese Republic, municipalities find themselves bound by a legal structure (Law 75/2013, of 12 September 2013), namely that of having to ensure the administration and maintenance of local heritage, as well as the promotion of written documents that may "protect and perpetuate the history of the municipality". This regulation does not provide specific details on how such an outcome is to be achieved, viz. in terms of management. Another law (107/2001, of 8 September 2001) is more general, and outlines the conservation principles for cultural heritage, including a section on archaeology, but in this case the authority is not specified, and the law does not even mention the municipalities directly. The terminology is partly convergent towards urban and territorial planning, by default largely in the hands of local power, but still remains contingent on the approval of a heritage authority, implied to be national or at least supra-regional, with regard to potential impacts. Practical, sustainable initiatives do gravitate toward the municipality level, notwithstanding a few regional actors (Branco 2019), mainly for oversight purposes, such as the regional directorates for Culture, which in fact are decentralized entities of the Ministry of Culture. As also mentioned above, the administrative structure in Portugal remains heavily centralized, giving rise to serious limitations for sub-national (i.e. municipal and regional) governance (Silva 2019), with these levels at the same time being bound by the enactment of the Municipal, Intermunicipal and Regional Corporations Act of 1998. In practice, this entails that local elected officials do have a number of instruments by which to choose their own governance structure (Tavares and Camões 2010).

It has been demonstrated that key differences in culture-focused expenditures stem from "non-neutrality" (i.e. ideology) in the Portuguese municipalities (Cruz 2007), and therefore have a serious impact on sustainable heritage policies. Still, local political decisions affecting heritage constantly require central permission and scrutiny, even for minor bureaucratic plans. This comes in the wake of decades of inventories on municipal heritage, mainly archaeological and artistic, and city planning (through the so-called *Planos Directores Municipais*, or PDM), all of which deal directly with tangible heritage. Such plans include, in one form or another, the concept of sustainable development, its strategic component and assessment of implementation (Amado *et al*. 2011). Indeed, the creation of these legally

required plans was directly responsible for the initiation of a growing number of archaeological activities, albeit not specified in national legislation (Pereira 2019), and the recruitment of municipal archaeologists, in the absence of regional structures that, in countries with more decentralized administrative contexts, act as regional bodies carrying out a multiplicity of direct archaeological tasks. Despite the supra-local importance of several Portuguese tangible and intangible resources, often supported by collaborative networks, heritage management, simply put, remains a municipal concern (Silva 2014).
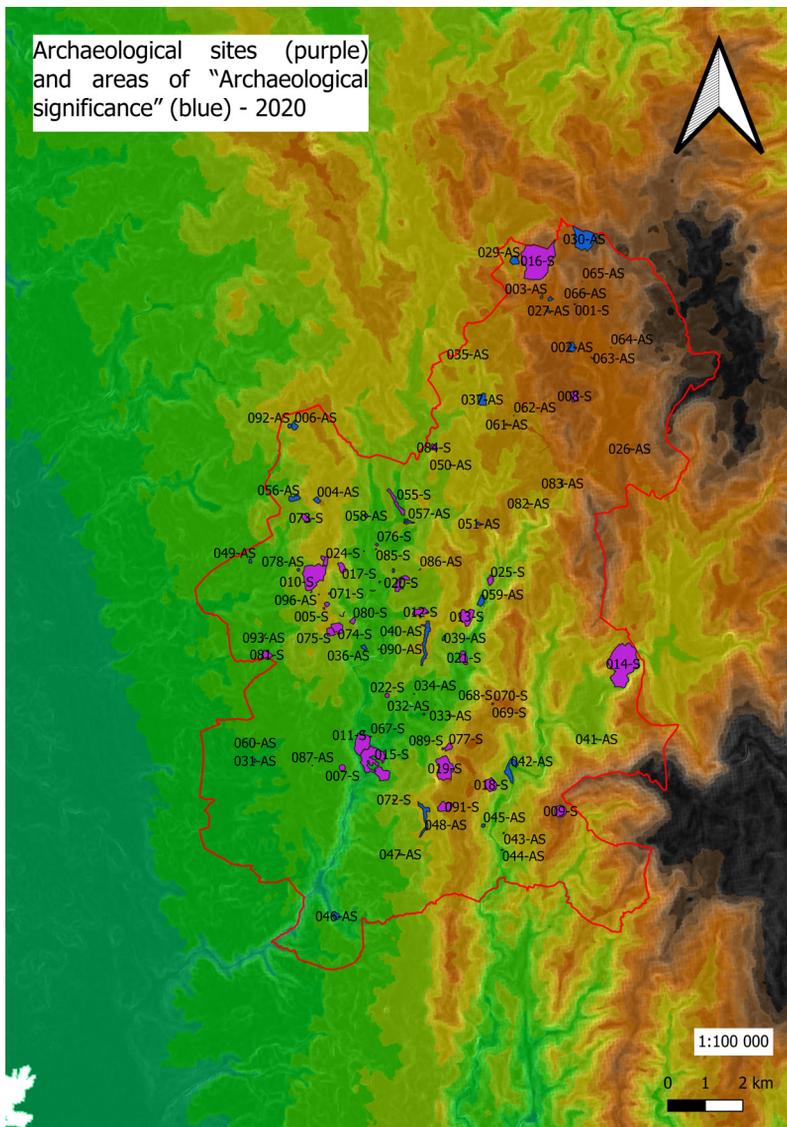

Fig. 2: Mapped locations with archaeological sites in the municipality.

Developed against this legal and political background, the municipal archaeological map of Oliveira de Azeméis functions as an implement for city planning purposes, and was reviewed for the second time in 2019. In the last quarter of a century, between the first PDM and the one currently in preparation, one finds a significant number of changes, as a result of successive methodological approaches, and of a better understanding of the historical landscape, with many more known sites present upon it today (Tavares and De Man 2018). More precisely, the total number of mapped locations has grown substantially, from just twenty-one in 1995,to sixty-six in 2013, and ninety-seven in 2019 (figure 2). Additional, unconfirmed sites may also be identifiable through place names or written sources, but would require further investigation and are therefore not included at present. In any case, a major reason for the noteworthy increase in numbers is the inclusion of not only archaeological sites, but of areas of "archaeological significance" as well, which allowed for a more flexible and functional directory. Another great advantage of late is the inclusion of such elements in digital cartography, through their integration into a GIS environment, and the creation of geo-referenced polygons of each individual heritage entry (De Man and Tavares 2019). It is precisely this heritage database that broadens the options available in urban development projects, through the office of archaeology and museology, and provides a tool for defining minimization and preservation measures.

Municipal options

Cultural oversight within a rational heritage policy takes many forms, however, and a combination of resources is instrumental to the execution of a political strategy. In addition to library, gallery and cinema infrastructures, the municipal archive functions as a hub for reading and exhibitions, but also as the location of the archaeological and museum services. It publishes a scientific journal on local history (Patrimónios de OAZ), and implements a project (Memórias de OAZ). The latter has been translated into an electronic platform for the identification and assessment of archaeological, built and intangible heritage. For each of these categories, a specific form was created, taking into account the level of information provided. Only relevant, user-oriented data is accessible to the general public, namely an overall description of chronological and typological aspects of each site. The system allows images to be added, as well as other types of files and hyperlinks to external sources, such as the "SIGA-nos" section of the municipality website, whereas access to the full technical information on each site remains restricted. This is all manifested in the frame of a 2013 Municipal Cultural Plan, created in collaboration with a number of stakeholders, with the purpose of offering durable guidelines in the field of cultural actions. One of the preliminary

procedures in this consisted of thematic working groups with local politicians, cultural agents, and representatives of social entities. During the working groups' sessions, a questionnaire was circulated, to acquire data on how the community would envisage the implementation of policies, and the definition of priorities. An online survey was directed at all residents, followed by a public participation period, during which individual citizens could access all working documents to prepare suggestions or comments. The notion that the creation of heritage policies requires inclusive, participative methods is deeply rooted in European practice, and has been furthered by EU funding programs that aim at (inter-) regional robustness. Local empowerment is taken as the most efficient formula for social development, and for improving forms of cultural autarky, uniqueness and distinctiveness. When it comes to heritage, the text of this municipal plan states explicitly the value of elements that may reflect local identity.

In the same light, the municipality's investment in a support structure for local heritage endorsed a series of initiatives, integrating best practices in a wider community empowerment effort, as compelled by international standards (Kyriakidis 2020). One such project involved the study and requalification of archaeological sites, as referred to above. It is true that the gap between scientific research and cultural commodification is often irrelevant, the latter taking precedence when it comes to communicating a cultural product. In practice, the visitor does not care about subtle chronological intricacies during excavation, or the software used in remote detection, to outline just a few procedures lacking immediate profit for tourism or community enhancement. In fact, a fundamental level of knowledge supports and precedes such processes, and consists of basic data improvement. Previous work and scattered information on individual sites required an effort of re-systematization. For Oliveira de Azeméis, the work of Fernando Pereira da Silva needs to be mentioned (Silva 1995) as the very beginnings of surveying the local landscape, leading to a substantial assortment of information being made available by the early 2000s, although this mostly lacked a satisfactory level of detail. In other words, recent challenges consisted above all of generating usable data for sites identified only through surface finds or literature. The Memórias de OAZ project and the DGPC database did help situate priorities in terms of prospective fieldwork.

A significant step in this process was the selection of locations on which to focus, in the scope of a feasible development inititative. Some sites had been partially excavated in the past, which would allow for a comparison with old information, both published and unpublished, and research hypotheses set decades ago. Other sites were chosen taking into account criteria such as legal, financial, and physical practicality, and also geographical diversity. For instance, both Recarei and Monte Calbo had provided some quite suggestive

but unsubstantiated preliminary indicators, basically surface finds and a number of sporadic references from the early 1900s. In contrast, Ul had already been subject to some test trenches in the 1980s, resulting in the discovery of a few still-visible structures. An ethnographic mill park, which attracts a not-insignificant number of visitors, is adjacent to the site and makes this hilltop both symbolically and logistically a central site for the entire project. Common goals consisted of gaining an understanding of the settlement chronologies, and then assessing the extent to which these occupations were synchronic, implying potentially competing or cooperative roles upon the territory. Briefed on these results, the municipality opted for further investment in archaeological fieldwork, through the POVOAZ - Povoamento em Oliveira de Azeméis project. Excavation and additional survey work was planned and scheduled according to a four-week-long season annually.

Fieldwork

Part of the initial fieldwork confirmed that, on occasion, older information needed to be thoroughly reconfirmed, instead of just taken as fact. The first trench at Ul was opened at the site's upper platform, and revealed an extremely disturbed stratigraphy with limited and scattered material. This observation contrasted sharply with the indications from Marques (1989), who had described the foundations of a Roman building and a Bronze Age hearth adjacent to the eastern slope. Later campaigns shifted the focus to lower sectors, where several structures, and more coherent materials were identified, in articulation with the settlement's outer wall. Overall, the materials point solidly to the (later) Imperial period, yet a few incoherent elements also indicate both previous and later occupations. A similar situation and chronology became apparent at Ossela, where some century-old references (Carqueja 1909) had described orthogonal and circular structures, as well as a few graves, which had been attributed to the Roman period, the Iron Age and the late medieval/modern times respectively. In 2013, public works next to a chapel resulted in the identification of some Roman coarse ware, and a 5th-century red slip form, which leant some credibility to Pereira da Silva's claim regarding the late antique use of the hilltop. But in the end, no clear pre-medieval occupation layers were observed. At some 600m north of the chapel, agricultural activity did bring up some pottery consistent with types found at Monte Calbo. This site, in turn, revealed a large dispersion of surface finds, which led to the definition of three separate excavation areas, quite far apart from each other. No structure whatsoever was identified, but very large quantities of Bronze Age pottery were recovered in what ended up being a stratigraphy heavily disturbed by recent forestation and agriculture. A similar conclusion was drawn, although on later chronologies (residual very late Bronze Age but essentially Iron Age), reflecting

distinct types of occupation, and based on just one test trench, at Recarei, where over the years some occasional Roman pottery had been recovered, without much information on context.

Two geophysical survey campaigns were carried out following initial excavation, and served to refine and orientate subsequent fieldwork (figure 3). These deserve an overview, as much in regard to their rationale as to their practical dimensions, as they are in fact costly and complex arrangements, and require a significant amount of planning. From a technical perspective, electromagnetic and geo-radar procedures were conducted separately, and their results combined and compared. The electromagnetic survey yielded considerable data of high quality and density, at Ossela and at Ul. The process basically consists of defining contrasts in magnetic values, which are obtained by inducing electromagnetism within the soil at regular intervals, in this case a conventional grid forming sq. m areas. The purpose was scanning the subsoil at different depths, the first sweep between 0.25m and 1.50m for Ossela; 1. 25m for Ul (where presumably any archaeological elements would be identified), the second and third until 6m and between 15m and 20m at Ossela, and only one second sweep, to 3m, at Ul, due to a much lower distance between the surface and bedrock. Frequencies used were 47,075Hz, 17,975Hz and 275Hz (Ossela) and again 47,075Hz and 35,775Hz (Ul), simultaneously on both electrical and magnetic bands. This configuration led to the establishment of samples at regular distances of 15 cm along the survey lines. At both Ul and Ossela, the onsite measurements and their interpretation were presented as geo-referenced surface maps, to facilitate interpretation. Data analysis was processed using GEM-2, WinGEMv3 software, and then Surfer9.0 and Matlab6.5 for the graphical rendering. The technical reports (López Jiménez and Sobral 2016a, 2016b) mention several procedures employed to optimize the readability of results, namely the application of filters or the highlighting of certain contrasts, and the selective removal of certain value sets. The main means of obtaining data for much of the mapping was through electrical conductivity, measured in mS/m, as it provides comparatively good clarity, hence a more coherent magnetic susceptibility. The results were provided with the itinerary followed during data collection, identified through UTM coordinates in datum WGS84, and the maps also use a UTM reference system.

On the other hand, the purpose of using GPR was to obtain parallel, longitudinal profiles, and to contrast these with the electromagnetic results. Grid dimensions therefore had the same 1m configuration. Methodologically, short duration electromagnetic impulses were created by an emitting antenna, with the returning signals being affected by refraction, scattering, or attenuation whilst passing through the subsoil. Also, the intensity of the returning signal captured by a receiving antenna constitutes an indicator of depth, as well as certain other

features of distinctive elements. At Ossela, residual humidity in the sediments affected the readability, and as a result, in some parts of the grid, the selected frequencies, 900MHz and 500MHz, yielded negative readings, as the signal bounced off the subterranean water. The equipment used at both locations was a Radas Systems Inc. GPR, with a double channel Zond12e signal acquisition unit, and a 500Hz antenna, in this case functioning both as emitter and receiver; an attached odometer allowed for a precise measurement of distances.

Fig. 3: Some images of the fieldwork campaigns.

In the case of Ossela, the combined survey results determined a number of potential archaeological features, concentrated in front of the chapel. Recent public works had created a layer of heavily disturbed soil, resulting in superficial anomalies. In addition, a sequence of longitudinal structures was identified at different depths, and this superposition indicated the possibility of sequential phases. These structures were interpreted as being funerary in nature, directly related to the chapel, although excavation failed to fully reach these structures. Two areas surveyed at Ul, on the other hand, demonstrated the existence of a few alignments with some perpendicular features, which also suggested some

toppled structures at a specific point, although most of the area seemed to correspond to a heavily disturbed stratigraphy. This hardly came as a surprise, given the widespread mechanical tree plantation that was evident across the site. Still, a coherent structure, linked to the rampart, was excavated in a comparatively well-preserved state.

From knowledge to practical applications

Alongside the strict archaeological fieldwork, the project is also very focused on the wider landscape, not only for scientific reasons, but primarily for the purpose of classification of impacts and risks. An exploratory, internal exercise undertaken by one of the authors, João Tiago Tavares, is looking at each site and its immediate surroundings, catalogued according to the established polygons, in an effort to record them in accordance with fairly universal agents of deterioration, both natural (fire, water, geological, meteorological and biological factors, vegetation) and anthropic (soil use, vandalism, pollution, social/daily use). The characterization of such impacts is to be translated through a simple set of steps, determining origin, probability, regularity, and intensity, in order to determine a degree of vulnerability. This will provide extra methodological robustness as the database develops into a more complex structure. In some instances, the polygons are to be optimized, as they required a set of micro-adjustments between the cartographic register and a set of actual landscape features. The main challenge, as was the case in other situations, was that of adjusting the polygons so as to ensure the conservation of heritage elements while not adding the imposition of fieldwork in areas with comparatively low potential. Such action is influenced by several factors, namely obtaining an improved understanding of the on-the-ground situation of the terrain, a more developed historical analysis, and plausible damage to structures inside the polygons. In any of the cases, maintaining the initial delimitation would potentially be inappropriate. In addition, this systemic reassessment warrants the inclusion of several sites identified in more recent years, many through isolated finds reported to the municipality. The validation and reconfirmation of sites implies a permanent exercise of optimizing polygons' outlines, reflecting both an increase in knowledge and territorial changes. Often the convention followed is that of establishing central points, around which an automatic area of protection is added. Polygon-based areas are more precise, in the sense that the dispersion of surface materials, along with the configuration of structures, or even of the topography, is never fully concentric. A limitation to highly precise delimitations may be the unnoticed exclusion of unknown heritage components. On the other hand, opting for a central dot may be considered a reasonable approach when no survey is possible, or if a variety of sites are concentrated – oftentimes overlapping – in a small area, in which case the definition of polygons is of little

use. But even then, limitations remain, and a perfectly concentric space around an arbitrarily chosen central point can become excessive, as it may include areas with no archaeological importance.

In the case study of Oliveira de Azeméis, the heritage site inventory was transposed to a controllable database. In short, it articulates technical inventory features with the type of heritage elements and their legal and administrative circumstances. In addition to providing a structured background for strict academic research, a daily application is of course related to urban management, and in particular to construction and agriculture. It forms a potential operational backbone for local authorities to plan the future of the territory under their custodianship. Moreover, a clear and mapped identification of heritage resources provides developers with a degree of certainty when planning, which therefore promotes a climate conducive to growth (Rautenbach *et al*. 2009). While all photogrammetric and spatial information on the municipal tangible heritage is transposed into a GIS environment (using QGIS, a free and open-source cross-platform desktop application; figure 4), the effectiveness stems from the integration of this with the Geographical Portal, an incorporated geolocation system used by other municipal services (figure 5). This portal is publicly accessible through the municipality website, and provides a user-friendly interface, allowing the selection of twenty-eight different layers, with corresponding sub-layers, aggregating information on themes such as census data, topography, cartography, land division, traffic and transportation. Further opportunities consist of densifying the use of complex data, namely by superposing trends in environmental, anthropogenic, and even socio-economic factors at the municipal level (Spiridon 2016), as they often are studied at a larger or geographically more integrated scale. But even from a merely visual perspective, GIS allows for a better definition of the place of heritage in urban growth (Bushmakina *et al*. 2017). Another pervasive challenge, managed through the site inventory, is that of the conservation and restoration of excavated structures. In some cases, they are considered to be inadequate for commodification, and are therefore covered with a protective layer, which provides a solution to some of the technical issues. In other situations, when structures become part of a leisure itinerary, preventive and remedial actions are required to ensure continued structural integrity. Few municipalities have permanent conservation services, with these sometimes being attached to a museum. In the case of Oliveira de Azeméis, this sort of activity is privately contracted, and therefore depends on budgetary cycles. As far as archaeological conservation is concerned, several structures underwent reinforcements and herbicide treatments, the results being continuously monitored by the office of archaeology and museology, through the site database, which here also plays a fundamental role.
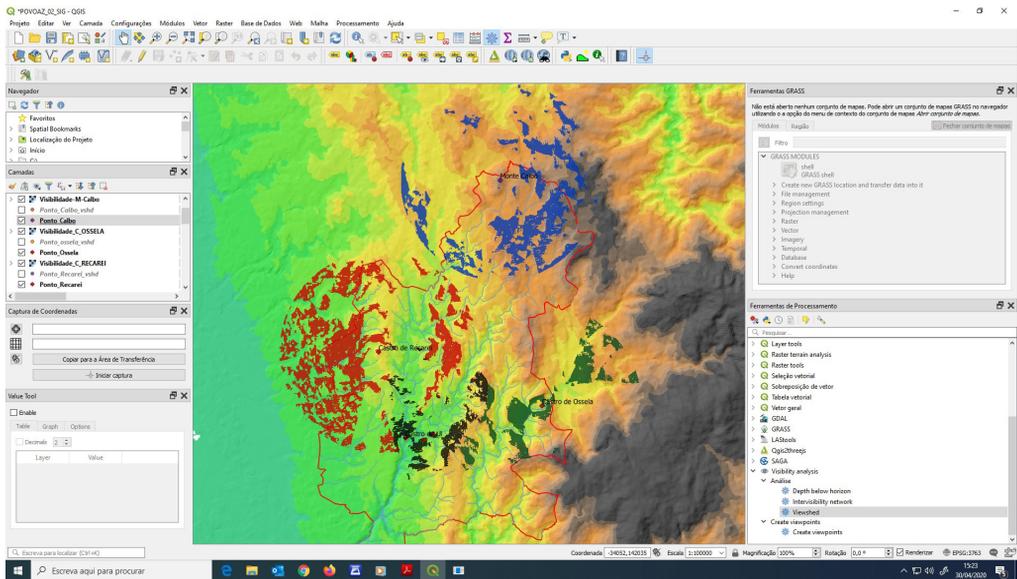
Fig. 4: A screenshot of visibility analysis in QGIS of several hillforts in the municipality.
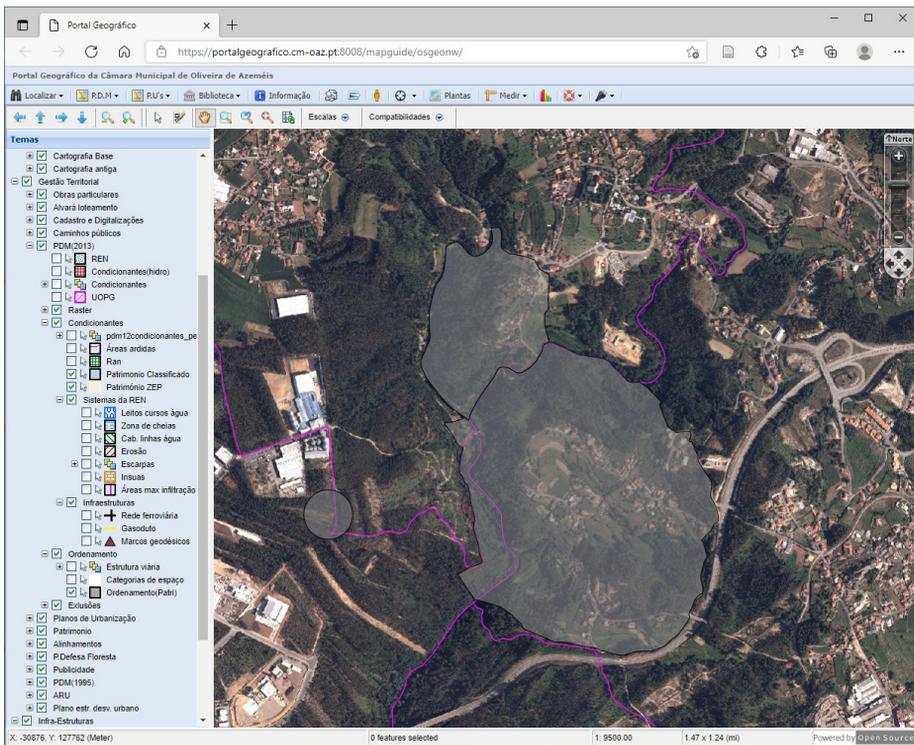

Fig. 5: A screenshot of the Geographical Portal of the municipality integrated with the archaeological data.

Knowledge and its processing on digital platforms constitutes of course an essential starting point for executing daily work on heritage, in particular that related to fragile, vulnerable sites, which face specific problems that require tailor-made solutions. One of the most common challenges resides in property issues, and the practical impossibility of the municipality expropriating and then managing dozens of private parcels with some degree of heritage relevance. It is in many cases materially unrealistic, procedurally unfeasible, and socially improper to enforce strict protection on poorly understood archaeological realities, especially in a territory with minute, heavily forested land parceling and agricultural micro-properties. Experience has shown that community awareness efforts and, more specifically, educational outreach actions targeting sensitive areas, give rise to a solid return on investment. The former is permanently put into practice by the municipality, to a large extent through the office of archaeology and museology; such activities typically consist of exhibitions, talks, or promotional campaigns, to inform the general public, residents or not, often partially including some sort of tourism product integration. The latter usually aims at bringing on board small groups that are directly affected by archaeological fieldwork and/or permanent limitations to construction or agriculture work due to the presence of a site on or adjacent to their property. A situation that in fact combines both approaches is that of Ul. The decades-long awareness that the hilltop has archaeological value reduces the need to start explaining the practical basics, as there has been a legal protective framework in place for a long time, together with some commodification, such as signs and paths for hikers. What remains lacking, however, is a clear explanation to the concerned landowners as to why a certain form of heritage matters, especially when preventive measures may directly affect their livelihoods.

All this refers to dynamic, qualitative outcomes, not absolute rulings, with the purpose of supporting municipal decisions on either site conservation itself or on non-archaeological development projects. At a primary level, such an exercise also articulates with the Directorate-General of Cultural Heritage, through their *Inventário Geral dos Sítios Arqueológicos*. A progressive digitization effort since the 1990s has led to a fully operational, searchable information and management system, named Endovélico (after a Lusitanian deity), as well as the connected Archaeologist's Portal (*Portal do Arqueólogo*), which ultimately feeds the database. This has different levels of access authorization, from the general public to individual archaeologists authorized to undertake fieldwork, and registered entities that need information on archaeological sites. Over time, this has potentiated further tools, for instance an online ArcGIS application that provides a free geo-referenced interface to the information contained in the Portal itself. In fact, the modernization of all public services at State level

includes a focus on archaeological heritage, by including citizens, instead of keeping information confidential, which in fact conforms to general international trends at the European level. The correlated optimization and flexibility of digital instruments was shaped at the DGPC level, in collaboration with their regional services, resulting in the Arqueosia project (an acronym for Modernization of the Archaeological Digital Services, in English). The two main purposes were those of boosting digital management and creating content. This was pursued, between 2017 and 2019, culminating in better usability regarding the mobile version, enhanced submission criteria for archaeologists, improved search options and information on visitable sites, with an English-language version also being added (Neto and Costeira 2019). The inventory of Oliveira de Azeméis is naturally included in this effort; it both benefits from it and contributes to its continuous update.

This is true as much for individual as for institutional cases, for instance at the infra-municipal level. The *Juntas de Freguesia* fall into this latter category. This term is usually translated in official documents as "parish council", and in some cases they correspond loosely to a London borough or a Parisian *arrondissement* (in the sense that a *freguesia* in Lisbon is demographically much larger than many cities in the rest of Portugal), although most are rural, and basically act as administrative sub-units within a municipality. Of importance to this text is the fact that they also have their own elected officials, and a budget that sometimes allocates resources to activities impacting both tangible and intangible local heritage. Common occurrences that require archaeological services to step in preventively are related to construction, ranging from public infrastructure projects to private building renovations. In fact, excavation at Ossela started when archaeological materials were found during the installation of water pipes in front of the chapel. Most sites recently identified are indeed a result of more careful monitoring, sometimes by the population itself, including that of activity on farmland and forested areas. Geo-referenced information on these often small surface finds is somewhat evocative of the traditional municipal archaeological maps, which basically aggregate coordinates and typology. The opportunity to more closely interconnect such raw data with integrated (e-)services is nowadays a technological reality that goes unnoticed to the average visitor. Another incorporated application relates to intangible dimensions, such as religious celebrations or traditional culinary festivals. This naturally has applications for the robustness of the tourism offer, but also for civic engagement and participatory citizenship.

Towards a strategic coherence

An intersecting matter here is the articulation and optimization not only of municipal services but of multi-year strategic options, which are first and

foremost conditioned by ideological, then financial and operational, options. All these levels are subject to legislation and to sociopolitical negotiation, and in that sense they all face heritage-based constraints. Two practical lines of action illustrate a socially relevant outcome. The first consists of supporting research projects, including archaeological surveys and excavations, logistically supported by the municipality. The incorporation of databases currently allows a good estimation of the potential for impacts on the landscape and property rights. As seen above, fieldwork has been intensified in the last six years, through two successive multi-year projects, and the polygonal areas of protection allow for community-sensitive approaches. Even heavily impactful actions, such as open area excavation following geophysical survey (e.g. De Man *et al.* 2017), tap into a municipal structure (legal, public works, museum, and other departments) for the agile dispatch of municipal resources, for instance in cases where farmland has been classified as having archaeological significance. Preliminary conclusions are based on geo-statistical inferences, which provide synchronic overviews for what would otherwise remain individual sites, separated by considerable distances. Also, common GIS applications for site dominance assessment in the historical landscape are establishing visibility ranges, which depend not only on topography but also on vegetation and, occasionally, on the built environment. If the archaeological inferences of such a linear application are not absolute (settlement dynamics do relate, albeit not in any way exclusively, to visual control between features), the applications on heritage commodification are immediate. Not only the site, but also the surrounding landscape, constitutes an integral heritage resource, which can be negatively affected by visually impacting elements such as power cables, antennas, wind turbines, or construction.

This leads to a second effect, namely the territorial coherence, as groundwork for economic development in the heritage tourism industry. The notion of "cultural landscape" depends as much on the intangibles providing cohesion as it relies on individual archaeological sites. In other words, the purpose of municipal investment is that of not only methodology in itself, but ultimately of social robustness. Such a reasoning links to forms of modern, intangible, "living" heritage, reinforced by historical landmarks: the festivities of Nossa Senhora de La Salette, centered on an urban hilltop park topped by a revivalist gothic style church and surrounding features, or the water mill park of Ul, adjacent to a visitable archaeological site, and in addition connected to traditional bread production (Paiva 2013), for which the municipality is seeking to obtain EU Protected Geographical Indication status. Not only is the smooth convergence of physical and intangible aspects important here, but above all that of authenticity, as felt by consumers, and the commodified construction of that same heritage. It has indeed been pointed out that town heritage plans sometimes unintentionally perceive this connection artificially

(Swensen *et al*. 2013), when in fact local communities are the key participants in the preservation of their heritage, especially when that heritage is not of major national interest (Mydland and Grahn 2011). The municipal aim for far-ranging sustainability goes some way to narrowing the gap between the academic, popular and political understandings of community heritage (Waterton and Smith 2009), and this is as much a social as a technological challenge. Oliveira de Azeméis's overarching municipal strategy consists of rendering these separate resources usable in a shared cultural network, spearheaded by what is called an Environment and Leisure Route. The PDM incorporates the integrity of immediate tangibles, such as forestry and archaeology, in a combination with education, religious festivities, outdoor sports, hiking and hunting, traditional arts and crafts, and then the economic tissue on the macro scale; this includes hospitality and other private and public initiatives, not only in tourism and other tertiary sectors, but in the construction and transformative industry as well. All this is to ultimately serve the common good, by establishing relationships of continuity, between the urban center and the administrative peripheries, physically connected through an arrangement of pedestrian routes, archeological interpretation hubs, and heritage-inspired events.

A sustainable heritage strategy for social and economic development at the municipal level needs to remain based on solid, integrated data management. This requires a longstanding interdisciplinary effort, to be sanctioned by successive elected officials, in the updating of knowledge systems, namely based on fieldwork and on public data disclosure through outreach activities. Oliveira de Azeméis has been investing in tangible heritage policies, which are in turn built on cohesive territorial awareness. At the micro level, it is the daily fieldwork, surveys, on-site verification and conservation procedures that feed into a cross-thematic database. In the end, information technology provides back office agility for municipal services, as well as open access knowledge, facilitating public involvement. This corresponds to an effort witnessed in municipalities elsewhere, as some form of heritage management plan is needed transversally, between culture, public works and tourism departments. Regardless of the precise configuration and operational tools, the integration of municipal resources always constitutes a factor for social optimization, as much in the technical substrate as in the delivery of a product or service itself. This is where an articulation with industry, and in practice also with non-commercial, institutional or private stakeholders, becomes relevant. From both the supply and the demand sides, cultural tourism represents one obvious social interface of the abstractness of pottery studies, conservation, and archaeological investment in a purely academic exercise.

Conclusion

The purpose of a municipality investing in a coherent heritage strategy is local communities' direct use and enjoyment of their unique resources, and ultimately their validation of what is a shared, local, cultural resource. A major requirement for success is predicting the territory's dynamic nature, the continuous transformation of its heritage, and the changing relationship residents and visitors have with the built heritage, cultural landscapes, and individual heritage elements. The office of archaeology and museology has, since the very beginning of the fieldwork activities, invested in outreach events, such as evening talks, on-site visits, non-specialized publications, and finally a small exhibition proposal. The purpose is to deconstruct generally unattractive, complex and often monotonous procedures in an attempt to create a narrative of the overall results. The chronological brackets, between the end of the Bronze Age and that of the Roman Empire, reflect the settlement dynamics identified at the selected hilltop sites, therefore representing a local reality able to engage the population. Externally, the project outcomes produce branding advantages, thereby providing an added layer of municipal identity.

In the end, efforts put specifically into rehabilitating tangible resources address but a few select social bubbles, namely in the case of small, non-commodified sites. Apart from Ul, which is identified by most residents in association with heritage, very little significant cultural overspill is noticeable in other locations with archaeological potential. This is where a wedged integration may add considerable value, through ethnographic activities providing context and meaning to such locations. The festivities of Nossa Senhora de La Salette, of Cesar, of S. Brás de Ul, or of Nossa Senhora do Crasto de Ossela represent a powerful form of local heritage celebration and entertainment in which archaeology can participate as a meaningful element. Other cultural actions also create similar connections, which are promoted and, to a certain extent, managed as well by non-State actors such as the Association for Integrated Rural Development of the Lands of Santa Maria (ADRITEM in its Portuguese acronym). The aim of this entity is to promote inter-territorial coherence, mainly through cultural approaches (language, gastronomy, creative arts, lifelong education and, simply put, tangible and intangible heritage for the common good; one successful example with regard to Ul is the participation in the _Há Festa na Aldeia_ network of villages). Without these community-led activities, any municipal strategy would lack traction, especially in the field of heritage management.

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