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ARCHAEOLOGICAL PROSPECTION

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ENVIRONMENTAL IMPACT ASSESSMENT: ARCHAEOLOGICAL PROSPECTING

L. Rocha, G. Branco

1. INTRODUCTION

Portugal, like most other European Union member states, has included in its legal system the EU legislation (*Directive 85/337/EEC of the Council of Europe, of 27 June 1985, and following*) relating to the procedures for Environmental Impact Assessments.

This Directive aims to: "*identify, predict and interpret the environmental impact which a project or activity would produce if it were to take place, as well as to prevent, correct and appraise the project or activity*" (Conesa Fdez.-Vítora, 2010, 75).

For these purposes, the proposing party (individual or public/private body) which is interested in implementing the project should submit an environmental impact study to the relevant body for licensing. This study is a technical document that identifies, describes and appraises the foreseeable effects of the project on the environment, which includes a description of architectural and archaeological heritage as human components of the environment.

In accordance with the legislation in force on the matter of safeguarding cultural heritage (*Law no. 107/2001 of 8 September 2001*), the description of architectural and archaeological heritage to be included in the environmental impact study must follow a specific method, formed by defining archaeological works, which can only be carried out by archaeologists who are duly authorised to do so by the supervisory institution.

The supervising institution for archaeological heritage issued a circular on this topic - *Terms of reference for Archaeological Heritage Descriptions in Environmental Impact Studies*[1] - which lays down the minimum methodological criteria for descriptions of archaeological heritage, considering the type and stage of the project being assessed. This method can be divided into 3 complementary stages:

1. Data collection – which is recommended to include: document-based and bibliographical research, consulting official body databases, toponymy and physiography analysis using maps;
2. Field work - carrying out systematic and/or selective archaeological prospecting in order to locate the evidence found in the previous stage, or identify new heritage elements;
3. Data processing – brief summary of the heritage elements found, with a view to creating a hierarchy of their scientific and heritage importance, identifying and assessing the foreseen impact of the project and proposals for minimising, compensating and monitoring measures.

Systematic and/or selective prospecting is the only field work considered indispensable for the description of architectural and archaeological heritage. This makes it possible to establish a link between previously acquired knowledge, available in other sources, and existing information in the specific area of the project, the target of the environmental impact assessment procedures. It is important to get to know the area, in order to safeguard it.

[1] Available at: http://www.igespar.pt/pt/account/formularios/circulares/

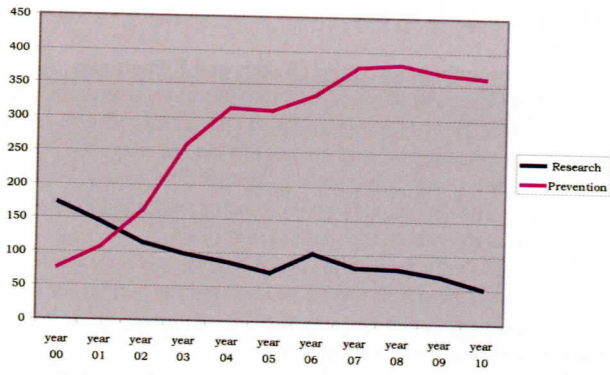

Figure 1: *Relationship between archaeological prospecting work performed in the context of archaeological prevention and research works.*

2. ARCHAEOLOGICAL PROSPECTING

The methods for describing architectural and archaeological heritage may include selective archaeological prospecting, to be performed when the project, which is the subject of the environmental impact assessment, has several possible alternative locations, so that the solution with the smallest environmental impact can be chosen.

Selective archaeological prospecting is understood to be a field walk through areas, selected based on specific criteria, which show archaeological potential based on the information and evidence gathered through research in books, documents, maps and others.

Systematic archaeological prospecting is understood as a field walk designed to visually identify and record all existing archaeological remains in the area foreseen for the project. The compilation of data available on the last 11 years (2000-2010) of archaeological activity in Portugal[2] shows that from 2002 onwards there was an increasing contribution of archaeological prospecting work performed in the context of preventative activities. This means, in most cases, that architectural and archaeological heritage description work was carried out, to be included in environmental impact studies.

In 2010, archaeological prospecting work carried out in the context of environmental impact assessment processes represented over 85% of contributions to inventories of existing archaeological heritage in Portugal, as opposed to archaeological pros-

[2] Compilation by the author, obtained by compiling the authorisation given for performing archaeological prospecting work, according to data available on *Endovélico*, the archaeological supervisory body's heritage database.

pecting activities performed in the context of archaeological research projects, with the aim of chronologically and culturally characterising an area.

Selective and/or systematic archaeological prospecting as a method for identifying archaeological remains has some limitations imposed, from the start, by an excessive dependence on visibility conditions of the ground. These limitations can cause consequences in terms of safeguarding archaeological remains, when the main objective is to describe, appraise and safeguard existing heritage in an area of land involved in the execution of the project.

As some authors recognise (Bakels and Kamermans, 2007), prospecting can only identify archaeological remains located up to a depth of 50 cm (arable soil), which is reduced drastically in non-cultivated areas, used for pasture and forests. As well as the use of the ground, the state of growth and type of vegetation, the results also depend on the time of year and the weather conditions under which the method is applied.

The fact that archaeological prospecting takes place in accordance with the timeframe for submitting the project for environmental impact assessment reduces its efficiency as a method for identifying archaeological remains.

These limitations mean that some countries do not consider archaeological prospecting an applicable method for managing cultural resources. For example, the Florida Department of Transportation exclusively allows diagnostic archaeological surveys - test pit sampling - whereas the Netherlands choose to collect soil samples - core sampling - that can reach a depth of up to 1.5m (Bakels and Kamermans, 2007).

One of the main issues raised when dealing with archaeological remains is connected with its interpretation as an archaeological site, which can be organized in a hierarchy according to the value of its heritage. Minimising impact in the execution phase of the project varies depending on this value.

The legislation on environmental impact assessments requires a description of archaeological heritage, understood as a significant set of evidence of past human activity. However, not all archaeological assets found during prospecting are significant for historical knowledge. For example, they could be archaeological material left in a secondary phase, depending on atmospheric agents and erosion.

Similarly, there could be sites which, depending on their state and the depth at which they are conserved, are undetectable through archaeological prospecting, meaning they are not taken into account in the relevant minimisation measures used in the execution of the project.

A research project is currently under way, supported by one of the authors of this paper (GB), which aims to assess the contribution of work carried out in the context of environmental impact procedures to archaeological knowledge in the Central Alentejo.

The preliminary data collected for this research, totalling 79 environmental impact studies from between 1995 and 2008, produced an inventory of 1535 heritage elements. Of these elements, 30% are buildings and architectural structures, 67% are archaeological remains and 3% are undetermined remains.

Dealing specifically with archaeological heritage, around 40% of the heritage assets are "*scattered remains*", i.e., material remains found at the surface of the earth during archaeological prospecting, which do not have sufficient characteristics to allow a functional or chronological conclusion to be made.

Concentrating on data on "*scattered remains*", around 19% were subjected to intervention - archaeological surveys – as part of projects to minimise impact performed in the area. The intervention made - for a total of 79 archaeological works authorised - mostly (66% of cases) did not show preserved archaeological structures or contexts.

3. CONCLUSION

In Portugal, the methods for creating descriptions of architectural and archaeological heritage to be used in environmental impact studies follows the methodological criteria defined by the supervisory body for archaeological heritage.

This method requires selective or systematic archaeological prospecting to take place, as field work designed to confirm the evidence and information gathered in bibliographical research, and to identify new heritage elements.

Heritage elements identified in the area which is foreseen to be affected by the project are attributed a cultural value. According to this value, minimising measures are proposed, whose costs will be covered by the project owner, to be put in place during the execution of the project itself. A project currently taking place in the Central Alentejo which intends to assess the contribution of environmental impact studies to archaeological knowledge has shown that prospecting as a preferred archaeological diagnostic method is not sufficient in adequately assessing the archaeological potential of an area affected by a project.

Around 66% of archaeological works performed in projects on archaeological remains classified as "*scattered remains*" did not reveal preserved archaeological structures or contexts. 34% revealed significant archaeological sites and, since they were subjected to intervention as part of the project, could produce delays and last-minute alterations in the execution of the project. It is important to recognise the limits of archaeological prospecting, above all when it is carried out under the pressure of a project, used with the aim of safeguarding archaeological heritage which, undeniably, will be affected by the project. It is important, therefore, to invest in knowledge and complementary diagnostic methods.

REFERENCES

AMADO REINO, X, BARREIRO MARTÍNEZ, D. 2004. La gestión del impacto y la prospección arqueológica. *Arqueología Espacial*. Teruel: Seminario de Arqueología y Etnologia Turolense. **24-25**: 231-249.

BAKELS CC, KAMERMANS H (eds.). 2007. *Prospection strategies and archaeological predictive modelling. Case Studies in Archaeological Predictive Modelling*. Leiden University Press: Leiden.

BRANCO, GERTRUDES (IN PRESS). Património Arquitectónico e Arqueológico: (pré)conceitos. *Praxis Arquelógica*. Associação Profissional de Arqueólogos: Oporto.

CONESA FDEZ.-VÍTORA, VICENTE. 2010. *Guía Metodológica para la Evaluación del Impacto Ambiental*. Madrid: Ediciones Mundi-Prensa. 4.ª edición.

GOMEZ OREA D. 1998. *Evaluacion de impacto ambiental*. Editorial Agricola Española: Madrid.

PARTIDÁRIO MDR, PINHO, P. 2000. *Avaliação de Impacte Ambiental. Guia de apoio ao novo regime introduzido pelo Decreto-Lei n.° 69/2000 de 3 de Maio*. Instituto de Promoção Ambiental: Lisbon.