The use of digital mobile technologies for geoarchaeological survey: the examples of the Pinilla del Valle raw materials project

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Archaeology and Apps

There is a general tendency to reduce the use of paper and to simplify and unify different tasks in the smallest number of electronic devices possible. That is especially important when it comes to archaeological field work, such as survey, that imply walking long distances while recording data and recovering samples that testify the same data. Application Software – also known as apps – have been developed with educational and scientific purposes, many of them with a full version only unlocked by payment of a fee. In the field of Geology there are smartphone and tablet Apps with, among others dictionaries, mineral guides, petrographic databases. For example, the British Geological Survey has an interactive geological mapping of the UK available on the App iGeology and iGeology 3D with non-commercial use. The Geological Survey of Denmark and Greenland developed aFieldWork, an App dedicated to the description of geological localities. Although there is a variety of applications available, none of them directly targets the needs of geoarchaeological surveys, and particularly the recording of variables specific for raw material sources characterization.

Archeosurvey

Archeosurvey - Raw Material Edition application, how it works in the field, the analyzed traits and the Pinilla del Valle survey project as a case study using the app. The new edition of the app came from the necessity to perform geoarchaeology surveys in the Lozoya river valley (Madrid, Spain) in order to study the lithic raw material sources of the Pinilla del Valle archaeological sites. With each record the App allows to register: surveyor name, site id, sample id, toponym, position of the raw material, visibility, access, rock type, Munsell rock color, geomorphology, size of available raw material, observations, GPS coordinates, its position on Google Maps and a photo. The database is organized in a .txt file that can instantly be stored on a cloud system if there is internet connection or easily be imported to an Excel spreadsheet. This file containing the GPS coordinates is also ready for a GIS integration.

Pinilla del Valle Raw Material Survey

Pinilla del Valle is an archaeological Upper Pliocene site in a karst complex of Upper Cretaceous dolomites intensely used by Neanderthals. It is located in the Lozoya river valley at about 1100 m a.s.l. within the National Park of the Guadarrama Mountain Range in the Iberian Central System (Madrid, Spain).

For the study of lithic raw material provenance of Pinilla del Valle sites the objectives in the field during survey are very different, and so is the analysed and recovered data. Instead of looking for possible sites we are looking for possible exploited sources of rocks/minerals in Prehistoric periods. For that reason, a new version of the app was created to answer the needs of the geological survey since most of the descriptive fields had to be changed to meet the criteria of geoarchaeological analysis in the field.

The Lozoya river valley is marked by a wide variety of lithic resources that are present in the archaeological context. The region is also geologically

Figure 1: QR code for download of the Archeosurvey mobile application.
Figure 2: Home screen and frontpage of the ArcheoSurvey - Raw Material Edition mobile application.

very complex with a variety of lithic resources in primary and secondary position. To perform geoarchaeological surveys first we did a geological bibliographic study. The information collected allowed to organize and perform punctual field surveys to understand the distribution and characterization of the available knappable lithic resources in their different positions – primary (i.e., rock outcrops) and secondary (i.e., fluvial or slope deposits). Geoarchaeological surveys are especially important for the study of lithic raw material procurement because secondary sources are seldom mapped on geological cartography and these are usually the most used sources exploited by prehistoric groups (Clarkson & Bellas 2014).

Discussion

The main advantages of a paperless recording method by means of a mobile application are ecological and cost/efficiency related. The reduction of paper and number of devices by combining functions in one leads to reduced costs that allow for an optimization of the reduced financial support archaeological research projects face. Overall, for the Pinilla del Valle raw material survey the app allowed an increase of efficiency with less human error and cost, optimizing time that can be used to analyze and interpret the collected data.

Bibliography


