

# **A GEODIVERSITY MAP: GEOLOGICAL-TOURIST MAP OF CALAMUCHITA'S VALLEY, CORDOBA, ARGENTINA**

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## **Abstract**

In the last decade, interest for geological events in the country has grown. On the basis of the geological sheet 3166-36- in the Calamuchita's Valley, one of the main touristic area in the province of Cordoba (Argentine) which also includes important sites of geological interest, arose the initiative to develop a cartographic product according to the new geotouristic demands. This new product should stand out and link the main touristic circuits with the sites of geological interest, on a simplified geological basis of easy reading and understanding.

The geotouristic map is a practical tool because it not only shows a wide variety of places with geological interest of a region, but also incorporates the geological resource as a guide of the features of the region's environment. This guide increases the value of geological landscape because it adds an educative vision for those who are unaware of the basis of this science. This new educational tool is considered to promote not only a better understanding of this natural science but also of tourism and its related economic activities.

## **Introduction**

In spite of the strong relationship among the geological environment, the ecosystem and the socio-cultural processes, most of the people have a relatively shallow knowledge about the geological heritage and the geological science itself. Nevertheless, in the last decade, interest for geological events in the country has grown. That's why new expressions such as "geodiversity", "geotourism" and "georesources" have arisen.

We define geodiversity as "the variety of geological elements, including rocks, minerals, fossils, soils, landscapes and geological units that were produced and may be taken as evidence of the evolution of the earth."

Therefore, it can be said that every particular portion of the earth had its unique geological print which makes it distinguishable from any other.

This differentiation gives rise to potential tourist development, underpinning the promotion of initiatives for outdoor activities.

Nowadays, the geological heritage has become not only a scientific and educational resource, but also an economic one, specially when planning strategies for sustainable development (geotourism), particularly in natural protected areas.

The geological mapping carried out by the Geological Mining Survey of Argentina (SEGEMAR) at scale of 1:250.000 or 1:100.000, includes a particular chapter, like an inventory, that describes briefly the sites of geological interest (SGI) in the area at issue.

This systematization of the SGI gave rise to the project “Sites of geological interest of Argentina” summarized in two volumes in which 72 SGI are described. A similar work referred particularly to the Province of Cordoba was published by Leynaud (1999).

On the basis of the geological sheet 3166-36- in the Calamuchita’s Valley (Gaido *et al.*, 2006 y Gaido, M.F., 2006), one of the main touristic area in the province of Cordoba (Fig. 1) which also includes important sites of geological interest, arose the initiative to develop a cartographic product according to the new geotouristic demands. This new product should stand out and link the main touristic circuits with the sites of geological interest (georesources), on a simplified geological basis of easy reading and understanding (geodiversity).



Fig 1: Area of work.

## **Objective**

The purpose of this thematic map is to promote tourism related to geological knowledge, standing out sites and circuits in order to show the geomorphology, tectonic, paleontology and landforms of the region.

An innovation in this field, is the design of circuits connecting different sites of geological interest by means of georeferenced points in order to allow a fast guidance at the field to anyone provided with a GPS. This information ensures a safe and precise displacement along the different geological sites described in the map and the traditional itineraries of the region, on a simplified geological base of easy reading and understanding. In this way, the concept of “geotourism” is introduced.

## **Methodology**

The geological sheet 3166-36 Calamuchita’s Valley at scale of 1:100.000 was represented on a topographic basis at the same scale, provided by the IGM (Military Geographic Institute). The digital version was accomplished by means of the ArcInfo 7.1.2 (ESRI) software at Cordoba’s Department of SEGEMAR. The version was transformed in a geographic information system using the ArcView 3.2a (ESRI) software and the final version was refitted with a graphic design program in order to obtain a final product on which the topography, geological features and sites are easily recognized.

## **Procedures** (for the accomplishment of the Geological Sheet)

The topographic basis, road networks and hydrographic features were specially pointed out due to the fact they are the main elements of reference for field positioning.

The geological thematic layer was simplified from the original map using a practical lithologic criteria based on a primary genetic rocks classification representing metamorphic, igneous and sedimentary rocks. Geological units with outstanding features (like dikes or pegmatites), easily recognized at field even by people without specific geological knowledge, were also represented.

The chart with geological references allows the reader to know the age of the geological unit. Geological sites have been notably represented in the map and described in an attached table with their geographic location and main features displayed. The map also includes different landscapes to visit and an altimetric sketch of the region which gives indications of the geographic difficulties of the area (Fig. 2).

## Conclusions

The geotouristic map is a practical tool because it not only shows a wide variety of places with geological interest of a region, but also incorporates the geological resource as a guide of the features of the region's environment. This guide increases the value of geological landscape because it adds an educative vision for those who are unaware of the basis of this science. This new educational tool is considered to promote not only a better understanding of this natural science but also of tourism and its related economic activities.

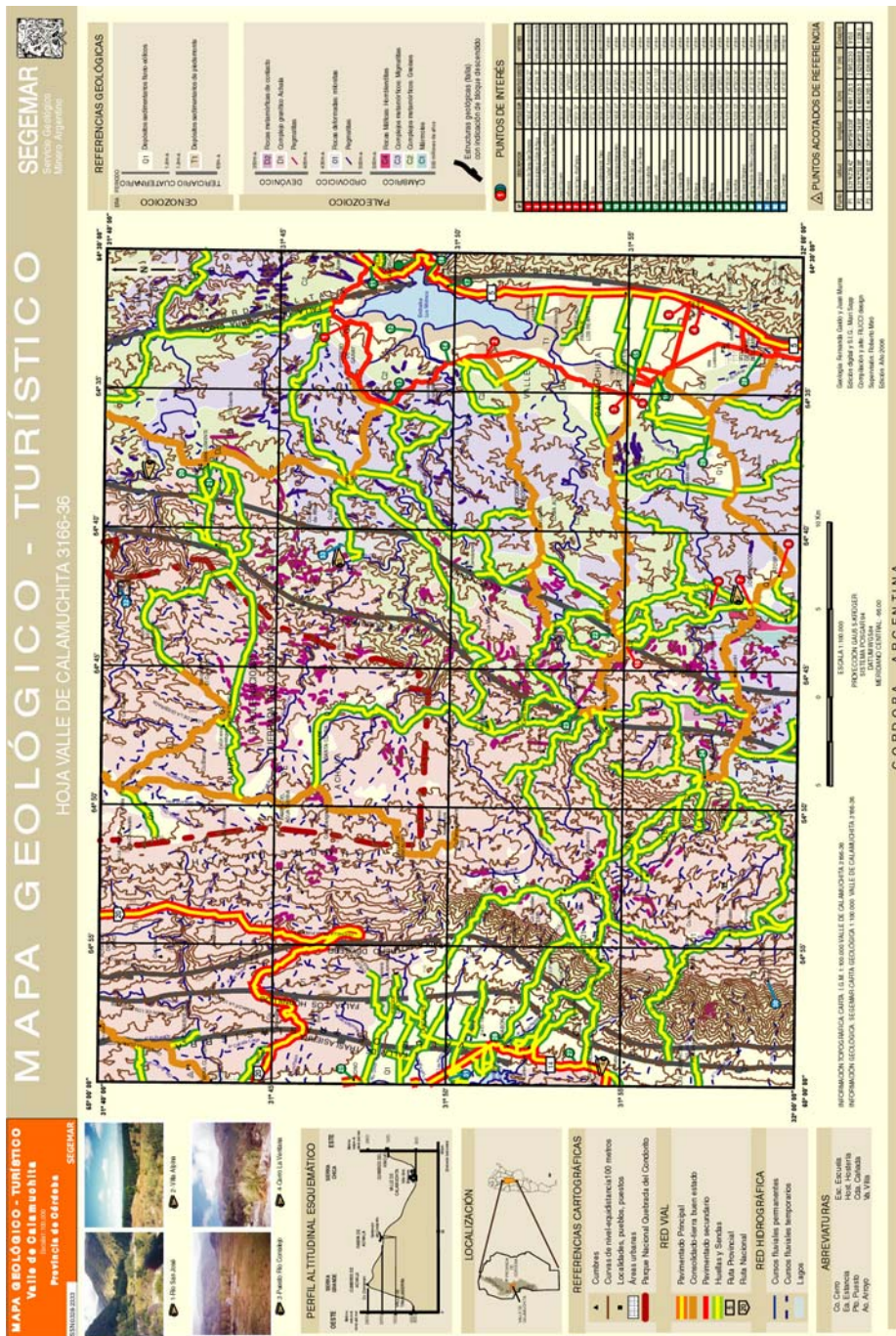


Fig 2: Geological-tourist map of Calmuchita's Valley, Córdoba province, Argentina.

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