

THREE CASES OF SUCCESSFUL GEOCONSERVATION IN THE NATURTEJO GEOPARK (PORTUGAL)

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1. Introduction

Geoparks are mainly social/political commitments and not strictly geologist projects. They must include local communities that everyday experience, but usually have only empiric inherited knowledge about their Geodiversity. The Geologist work is simply to learn from the Geopark' rocks and then place gently, but firmly and progressively, important issues of the geological landscape on people's culture, educating consciousness and opening new opportunities for local economy development. It is to follow local decision-makers and the needs of populations from direct contact, giving advice and guiding in decisions concerning the protection of Geological Heritage and the interpretation of Geodiversity. The Geoconservationist work is fundamental to find the equilibrium between population wishes and environmental wealth mostly appreciated by ecotourists that can be the last solution for deprived local economies. With the communication strategy being applied every day and invariant concerning the scale of action, from local to national, interest by Society is kept high, and visitors increasingly arrive, both national and international ones. But their interest on the Geopark must surpass during the visit by other means the idea they got from promotion. So, promotion must be followed with a good communication (signing) strategy that easily takes people to visit the best of the Geopark. Being here, visitors must find the best conservation efforts and facilities to understand easily and fully enjoy geological attractions and all heritages. This is the way to transform curious visitors in recurrent happy tourists. This is the way to foster local economy and proud among local communities. The protection and interpretation of ecosystems, including geodiversity that supports the biodiversity where Man is part of, is a fundamental part of the Geopark's daily life.

Geopark Naturtejo Meseta Meridional was integrated in the European and Global Geopark Networks in 2006 before the protection of geological heritage was defined in the National Law. The pioneering work of geologists and geoconservationists starting from the seventies and mostly during the nineties led to protection of geosites with the support of society and created the basic conditions to develop such kind of Geopark project for the first time in Portugal. Naturtejo Geopark born from the social/political need to protect the important trilobite trace fossils from Penha Garcia. In those times (after 2000) the national Cultural Law was preferably used, by its speedy wide range application, to protect geosites and to manage them from municipalities. The work the Portuguese geoconservationists and ProGEO-Portugal, the existence of Naturtejo Geopark as part of European Geoparks Network which is closely cooperating with the Institute for Nature Conservation and the Environment Ministry since almost its early beginning and the huge success of the celebrations of the International Year of Planet Earth changed the national Nature Conservation Law. The newly published Decree-Law 142 of 24th July that defines the political standards for environment establishes the new juridical regime of Nature Conservation in Portugal. Geosites, Geological Heritage and Natural Values (including geosites) are herein defined. The Law also creates the Fundamental Network for Nature Conservation including the National Network of

Protected Areas and areas protected under international agreements with Portugal. Geoparks are also included in this Law and have now proper integration and rules under the status of Areas with Conservation Designations of Supranational Importance, i.e., the Decision of the Executive Council of UNESCO (161 Ex/Decisions, 3.3.1), adopted in Paris in 2001, related with Geosites and Geoparks.

At the information organizational level, this Law creates the Natural Heritage Information System that fosters the inventory of geosites in the country and in waters under Portuguese jurisdiction. Also, the development of a National Inventory of Protected Natural Values archives all the information about geosites. Both operational instruments promote scientific research and knowledge about natural heritage, as well as monitoring of geosites as far as the recognition by Society of the intergenerational, economic and social heritage value of biodiversity and geological heritage. But Nature Conservation goes beyond laws. It is the vision of some for the long-term benefit of many. But there are cases where short-term big investments, neglect or just lack of vision are constantly threaten special areas for Nature such as Geoparks. Here we present a resume of the work done (and the main responsible) for the successful protection of three geomonuments in the Naturtejo Geopark. Resulting from this work was the two Geoconservation Prizes attributed to the territory by ProGEO-Portugal and National Geographic-Portugal in 2004 and 2007.

2. Portas de Ródão Natural Monument

Portas de Ródão is a Natural Monument extending for 965 ha. Portas de Ródão was considered the most important Portuguese geomonument, at the landscape level, by the pioneer geoconservationist Prof. Galopim de Carvalho. "And the river (Tagus), at that point, forcing its narrow, deep, and angry course between lofty and precipitous banks, which rise into Brown and barren mountains, forms a grand imposing picture..." writes Moyle Sherer, at the end of the 18th century, about Portas de Ródão. The request for protection of Portas de Ródão started many years ago but only after the development of Naturtejo Geopark municipalities reunited to work together for the cause of Portas de Ródão, since ancient times an *axis mundi* for these people. During the UNESCO Geoparks Conference in Belfast (2006), and following the integration of Naturtejo in the European Geoparks Network, the State Secretary of Environment approved the protection of Portas de Ródão. The application was coordinated successfully by Dr. Jorge Gouveia from the local Association for Studies of High Tejo NGO on behalf of the municipalities of Vila Velha de Ródão and Nisa, with the multidisciplinary scientific cooperation of the Naturtejo Geopark and several other regional and national institutions (natural parks, universities) and was finished in 2005. In these studies and besides Portas de Ródão geomorphosite itself, the inventory includes: 32 geosites of geological, geomorphological, palaeontological and geomining interest; 10 EU Habitats with 2 Priority Habitats (temporary Mediterranean ponds and fluvial forests of *Alnus glutinosa*), 119 species of birds (15 endangered), 20 mammals (1 endangered), 10 of river fish (3 endangered), 10 of amphibians (1 endangered) and 12 of reptiles (1 endangered); 26 archeological to historical sites from Lower Paleolithic to modern times; and, 13 legends. After a meeting between the Geopark's managers and the State Secretary of Environment, Dr. Humberto Rosa, and the successful integration of the Geopark Naturtejo in the EGN finally the first Portuguese geomorphosite was declared protected under the Law for Nature Conservation in 2009 and a management plan will be prepared. With the Institute for Nature Conservation, Vila Velha de Ródão and Nisa municipalities will manage the Natural Monument with the commitment of Naturtejo. This the 7th national Natural Monument in Portugal and the first not mainly related with paleontological findings.



FIGURE 1: “Rock Detectives” visiting the newly declared Portas de Ródão Natural Monument (left). Black stork (*Ciconia nigra*) is increasing its number in Portas de Ródão, an Important Bird Area.

3. The flooding of Portas de Almourão geomonument by the building of Alvito Dam: an old quest won

In September 2007 the Government presented the new Dam National Plan. This presents the project to build 10 new big dams until 2020 in order to face the high energetic dependency on fossil fuels, whose prices increase every day, substituting by renewable sources of energy. One of these dams will be the long expected Alvito Reservoir, at the Naturtejo Geopark. This dam was to be built in the Ocreza river right in the Portas do Almourão geomonument! The project to build it started during the forties with the idea of creating a concrete monster 140 m high. The new project intended to create a dam wall right before or after the geomonument changing forever and for sure one of the finest cultural landscapes of the Geopark. It is an investment of 67 million Euros and this reservoir will produce 48 MW of installed energy and 62 Gigawatt/year, which means 5 million Euros per year of energy. The reservoir would have 209 million cubic liters implying submersion of the valley along several dozens of kilometers.

The dam is considered a strategic investment for the region for the next ten years. The mayors from the affected municipalities were very glad because they were promised environmental, tourist, water for agriculture and human consumption opportunities. However, there's still missing the studies of environmental impact. According to the study about the viability of the project, natural values in the building area are unimportant (flora, fauna among others). Among others are the outstanding geological heritage of Portas de Almourão (Fig. 2), one of the most important geomonuments of the Naturtejo Geopark and responsible for the integration of the territory in the European Geoparks Network under the auspices of UNESCO, which would be drilled and “concreted” forever. Concerning biodiversity, the area is part of an internationally recognized Important Bird Area (PT037), where several endangered bird species are nesting in the area, like the Bonelli-Eagle or the Black Stork and the Griffon Vulture, which will be disturbed and probably gone during 4-5 years of work for building the dam. Some of their habitats are Priority for EU concerning protection. In cause is the total eradication of one of the last natural corners of Naturtejo Geopark but all the politics and people agreed in favor of the dam. Only the people that live nearby, in the Foz do Cobre schist village and Sobral Fernando, did not want the dam. The building of the dam goes against the ongoing development of nature tourism in these villages, disturbs deeply local ecosystems and local life, changes weather conditions for traditional use of land and the right to the landscape of their ancestors is condemned.

The building of these ten dams implies the non-emission of 570000 tons of CO₂ to the atmosphere each year. In the next 10 years the demand for energy will not stop, for sure. The electricity business is also a fast growing one in Portugal and it needs power to be competitive. Building dams give a lot of money to the electricity and building companies and generally only has impacts on local economy during the building period (no more than 6 years for a big dam, less than one for small ones). There are almost no new jobs coming with the concrete. Tourism may be locally fostered by the existence of an artificial lake but in Portugal hinterland areas hope to bring closer the sun & beach tourism which are destroying the coast with resorts. Most of our dams are just deserted areas without people. Only very few dams represented substantial development of local economy through tourism. In the Geopark there are already 5 big dams and not a single one enabled the development of tourism. The agriculture is just a dream in our country of very old farmers and water has poor quality for bathing or consumption. The quality of the landscape built by thousands of years of local culture and millions of years of Earth dynamics, during Variscan and Alpine orogenies, and Life evolution, were about to be submerged or severely injured.

The Vale Mourão citizen meeting reunites one night every month in the small Schist Village of Foz do Cobreão to discuss the main issues of local society with the support of Incentivos Outdoor tourism company. For the second time, the theme was the destruction of Portas do Almourão geomonument by the Government decision of building a dam. People were first enthusiastic with the idea without knowing the real unsustainable environmental problems of building a dam. But this time the well informed Friends of Foz do Cobreão NGO, with the support of the Association for the Studies of High Tejo and Naturtejo Geopark, brought positive reinforcements to the discussion. In the meeting was shown unequivocally how the geological importance of Portas de Almourão prevented its destruction by the building of a dam: there are too many active faults in the area to fill with concrete! Later, the Mayor of Vila Velha de Ródão presented the new decision of the Government to build a smaller dam 1,6 km upstream from the Portas de Almourão, not interfering with the fascinating cultural landscape surrounding the geomonument. The cause of this sudden change on the plans was assumed recently in the newspapers by the director of the National Electrical Company: in cause was the protection of Almourão geomonument included in the Naturtejo European Geopark!

Nowadays the National Electricity Company is working with all local stakeholders to respect the demands of local people concerning their needs, as well as natural and cultural heritage protection. Quercus NGO - the national association for nature conservation and Geopark Naturtejo Meseta Meridional, with the strong support of Association for Studies of High Tejo and University of Minho, started an application to protect Portas de Almourão as Regional Natural Park. There were already inventoried 29 geosites and the protecting area for geoconservation was defined. This work sums to the biodiversity inventory developed by Quercus, the archaeological cartography already done by the Association for Studies of High Tejo, and to the cultural inventory made some years ago by the Group of Friends of Foz do Cobreão local association. The municipalities of Vila Velha de Ródão and Proença-a-Nova, local NGO's and companies, with the support of Naturtejo Geopark, developed geo-related short trails (Secrets of the Almourão Valley, Foz do Cobreão Schist Trail, Travel to the Bones of Earth and Roman mines Trail) to explore the geomonument (Fig. 2).



FIGURE 2: Portas de Almourão geomonument and setting, without the dam (left). Searching for gold as star-tourism product of this area (right).

4. Fraga da Água d'Alta: the last remains of the Tertiary subtropical forest

Before the Geopark first inventory to characterize geosites Fraga da Água d'Alta waterfalls were almost forgotten and invaded by the threatening *Acacia* neophyte. Naturtejo Geopark elevated this differentially-eroded lithological isocline scarp 50 m high divided by waterfalls (Fig. 3), in the Moradal quartzite ridge, to the condition of one of the 16 Geopark' geomonuments. Paulo Urbano, the president of the small village of Orvalho, took the right opportunity to benefit the area building accessibilities for the increasing number of visitor (more than 4000 in 2008!), cleaning old rubbish and controlling *Acacia* which gave space again for the autochthonous forest to flourish. After 4 years-long project Paulo Urbano launched the Orvalho GeoTrail, the thematic visit to Orvalho geosites and one of the most fascinating trails in the Geopark. Orvalho village organizes an annual event under the European Earth Festival with the support of Naturtejo Geopark. In this launching year more than 600 participants between 4 and 80 years old discovered a new world in Oleiros municipality! 7 km of hidden beauty, explanations about the Fraga de Água d'Alta waterfall and Cabeço Mosqueiro geomorphological viewpoint and the revival of Orvalho traditions of linen embroidery fulfilled the curiosity of all. On the top of the Mosqueiro mountain the Orvalho village prepared a cultural night with the Medieval Dinner and Celtic-derived rhythms at the sunset. Recently, researchers from the Institute for Nature Conservation visited the Água d'Alta deep valley and found a hidden treasure: in this mist environment protected from sunlight, in silica-rich soils one of the largest populations of *Prunus lusitanica lusitanica* still persists. The *Prunus* habitats are one of the most important from EU Habitat Directive (Code 5230). From the subspecies *lusitanica* less than 6000 trees exist in the world. Here researchers were marvelled to find more than 200 coexisting with *Viburnum tinus* (Fig. 3), Alders and the small fern *Omphalodes nitida*, an Iberian endemism. Altogether and *Arbutus unedo*, whose fruits are used in local production of jams and liquors, represent some of the last remains of the "Laurissilva" subtropical forest that during the Mio-Pliocene covered the SW of Europe and still persist mostly in some Macaronesian islands like La Gomera, in Canary Islands. Geodiversity and Biodiversity of Fraga da Água d'Alta deserves now to be protected as Natural Monument.



FIGURE 3: Fraga da Água d'Alta waterfall (left). Orvalho GeoTrail by the Água d'Alta deep valley surrounded by large numbers of the very rare *Prunus lusitanica lusitanica*. Photos: João Geraudes.

Naturtejo Geopark is special for its geodiversity and people living there know their rocks better than any geologist...well, at least in their own ways! They are proud users of their geological legacy and they honestly ask for help concerning protecting and managing of geosites for local development. Since Naturtejo began the project to create a Geopark it plays fair firstly with the locals, but also with the institutional supporters, service enterprises and evaluators. Naturtejo Geopark is part of UNESCOassisted European and Global Networks without having used others for comparison, asked for favors or acted with influences to reach international recognition. Naturtejo is a European Geopark after much work still ongoing, interest of local people and politicians, and several right decisions. And do not ever forget: a Geopark is never the will of only a bunch of geologists, usually outsiders; locals shall desire to be deeply involved, and we are all working for a common goal which is local development: Geology is just another weapon...well, in our case and for now, the chosen weapon!