

## Caves, Speleology and sustainable development

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### Abstract

The 21<sup>st</sup> century has a global commitment in the search for a new model of development, a model which can be sustained in terms of the environment, society, and the economy. For present and future generations to have a chance to have a better quality of life, it is necessary that all sectors of the society take up this challenge. Speleology, an interdisciplinary area combining aspects of science, sport, and culture, can and should contribute to this objective.

Karst areas, whether or not composed of limestone, are a wide-spread phenomenon and distributed throughout the world. Cities, industrial areas, agricultural areas, tourist centers – the use of the land in the vicinity of caves and speleological sites is quite varied. Poorly planned mining of limestone for agriculture and the production of cement, the construction of roads, dams and other major construction in karst areas, deforestation, the pollution of springs and underground rivers, vandalism, and destructive tourism all provide a threat to the rich speleological patrimony of the world. The situation must be changed, especially when we consider that this is such a unique patrimony, so very important for science, culture and tourism, and extremely fragile and irreplaceable.

This is the reason for the great urgency in fostering an integrated action of speleologists and their organizations on a global level in an attempt to foster the valuation and conservation of caves and karst areas. Educational campaigns, the development of legislation aimed at the conservation and adequate use of caves, an increase in the supervision and control of the organs responsible for the integration and exchange of information on an international level (including a general registry of all known caves), the protection of speleological sites on a local, national, and international level via the creation of parks and other protected areas, the development of a methodology for the management and control of tourism, the stimulation of research and the divulgence of research results, a search for international programs of support and financing for the study, protection and management of caves, among others, are actions which must be implemented.

It is fundamental, on the other hand, to increase such partnerships beyond the level of speleologists, as such, in order to transform the fight for the protection of caves into an objective of the society as a whole. For this, it is necessary that the society knows about the importance of this patrimony and they perceive the benefits of its sustainable use.

It is, for example, necessary to make the economic importance of caves visible and show how they can help generate jobs and improve the economy of the areas where they are prevalent. The work of speleologists in this area is fundamental to guarantee sustainable tourism and the development of these regions.

It is necessary to emphasize the scientific importance of caves in the area of geosciences, biology, archaeology, paleontology, and many other fields. It is important to value historical, religious, artistic and cultural aspects of the people of all regions of the planet, from the times of ancient pre-history up to the present.

It is equally important to associate the fight for caves with the defense of other resources such as the forests, the springs that bring us our drinking water, and biodiversity. It is also necessary to consolidate the study of caves and their role in the obtention of underground water for domestic and industrial use, as well as agriculture, the planning of roads, tunnels, dams, and other feats of civil engineering in karst regions, remembering that only committed involvement can help manage such areas and avoid the subsidence of dolines and the various social and economic impacts associated with karst terrains which influence urban planning in these areas. Speleology has much to offer in these areas.

As can be seen from the large number of areas involved, the protection of caves and karst terrains and their cultural and socio-economic value for the society as a whole should have priority for all speleologists and should be transformed into the principal mission of the UIS, making speleology a true instrument in the fight for sustainable development.