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GOAL Educational Resource: Geoheritage

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TITLE OF THE CASE	Integration of Geoethical aspects of Geo-risks within field trips of earth sciences academic courses
SHORT CASE DESCRIPTION	One of Geoethical subjects of the GOAL project is Geoheritage. Aspects of this subject are included in many various academic Geoscience courses. For example, introduction to Geoscience, tectonics, structural Geology, mapping, Geomorphology, Geological history, palaeontology and more. Many Geoscience courses include field trips as an integral part of the course. This educational resource presents examples of using Geoscience field trips to raise Geoethical dilemmas of Geoheritage and public knowledge and understanding.
KEYWORDS	Geoheritage, the outdoor learning environment, educational resource.
PRIOR KNOWLEDGE	Geoethics, The outdoor learning environment, Geoheritage, public knowledge.
AIM	Promotion of the integration of Geoethical values (ethical, cultural and social) within Geoscience academic courses.
OBJECTIVES	- To present concrete examples of field trip activities related to earth science phenomena that appear worldwide. - To present concrete examples of outdoor activities that can easily be modified for teaching in various academic courses in any country. - To present concrete examples of field trip activities that raise ethical, social and cultural dilemmas that appear everywhere. - To boost Geoethical education in schools and in higher education (social values).
CASE	Field trips are still a common teaching environment for many Geoscience academic courses. Moreover, the outdoor environment enables exposing students to concrete Geoethical dilemmas that rise directly from their field observations. However, to fulfil the educational strengths of the outdoor environment, lecturers have to change their teaching method in the field. In the outdoor, they should focus on active learning instead of their lecturing habit. They should use worksheets with instructions and questions that direct the students to interact directly with concrete phenomena and not with the lecturer (reference of the ebook). Following are two examples of the suggested method of raising Geoethical dilemmas concerning the preservation of our Geoheritage: **Case 1: Makhtesh Hatira as a Geoheritage phenomenon** The Israeli Makhteshes are a unique Geological phenomenon (figure 1).

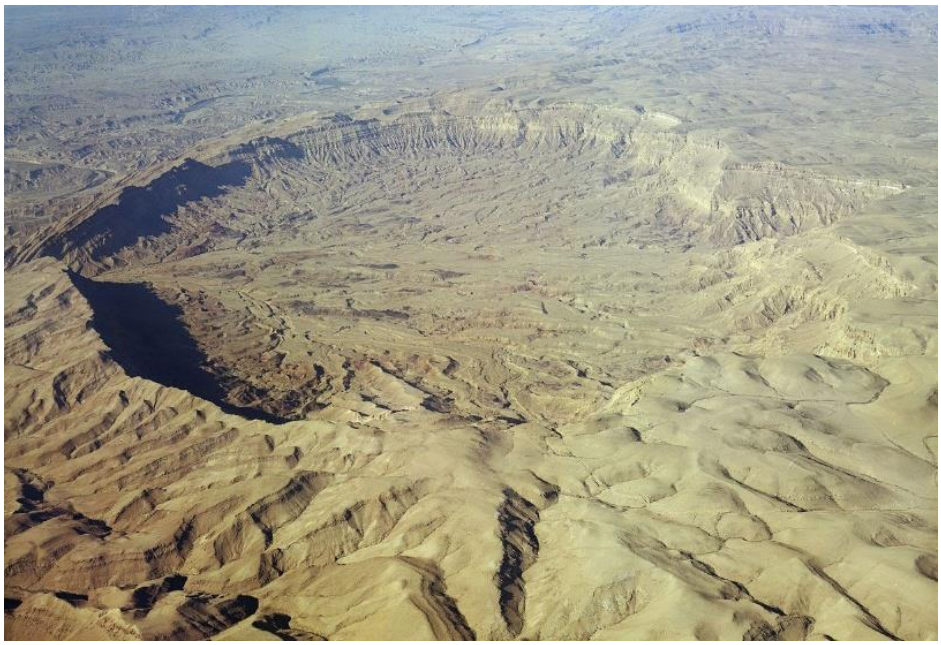

Figure 1: Areal view of Makhtesh Hazera, Northern Negev, Israel

Makhtesh is an erosional crater formed by the unique stratigraphy, structure, and Geological history of Israel's Negev Desert. Makhtesh Hatira as well as any other Makhtesh is an outcome of very long complex multiple stages process.

Case 2: Fossils as a Geoheritage phenomenon

Fossils are a central source of our ability to study, understand and reconstruct the cycles of marine and continent environments throughout the Geological time and the macroevolution of life on Earth. Therefore, fossils are a central component of the heritage of our planet. Although the fossilization is a very complicated process and only few percent of the living organisms were fossilized along the earth history, fossils are well known phenomena in many sedimentary rocks exposures all over the world (figures 2, 3).

Figure 2: Upper Cenomanian Marine fossils of Har Avnon

Figure 3: Ammonite Wall, Makhtesh Ramon

QUESTIONS

- What is the role of Geoscientists in educating the society about the importance of fossils as a central part of the earth heritage?
- What is the role of Geoscientists in educating the society about the need for the preservation of fossils?
- How should Geoscientists inform/communicate the public?
- Who should prepare Geoscientists how to communicate with the public?

PROCEDURE

Procedures concerning Geological phenomenon as Geoheritage

https://goal-erasmus.eu/wp-content/uploads/2020/02/procedure_for_IO4C-Geoheritage_educational_resource.pdf

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