Applicant UNESCO Global Geopark

Lavreotiki, Greece

Geographical and geological summary
1. **Physical and human geography**

The Geopark is located in Lavreotiki, a peninsula in the SE part of the Prefecture of Attica, just 60 km drive-distance from Athens, the capital of Greece. The Geopark’s boundaries coincide with the ones of the Municipality of Lavreotiki. Its favourable geographic location, its mild geomorphology and climate, coupled with its rich multi-metallic ore deposits have been decisive factors in attracting settlers throughout the millennia. The region was inhabited since thousands of years ago (at least since 3200 BC), being one of the largest mining centres in the Eastern Mediterranean during ancient times. Nowadays, the economically active inhabitants of the Municipality of Lavreotiki amount to 10.192 (40.6%) of the population and the employed to 7.747 (30.86%). The Municipal Community of Lavreotiki extends about 36 km² with Lavrio being the major city with 7.078 inhabitants; many villages and settlements surround Lavrio.

The area’s relief is characterized by scattered hills directed from NE to SW with an average altitude of about 250 to 300 m, wide valleys, fluvial terraces and alluvial deposits, depicting a landscape at “maturity” stage. As of Mediterranean climate, the area is more or less dry. The main fluvial system is the Potamos stream that flows down into the Gulf of Thoriko. Due to its geological conditions, several geomorphological features are found in the area, such as caves (playing an important role from the antiquity), dolines and particular shorelines.

The biodiversity in this region is rather rich and is dependent on many factors: climate, topography, geological conditions and human impact.

2. **Geological features and geology of international significance**

The geology of the area is mostly characterized by the alpidic orogen. In particular, it belongs to the Attic-Cycladic crystalline belt, which represents a polymetamorphic terrane. The Attic-Cycladic belt resulted when the Apulia and Pelagonian microcontinents collided after the Pindos ocean closed. Three major units, the Basal, the Cycladic Blueschist (CBU), and the Upper Tectonic Unit (UTU) can be distinguished in the Attic-Cycladic crystalline belt. Both the CBU and the UTU consist of dismembered stacks of nappes that formed during multiple collision and separation events between the African and Eurasian plates. These two units overlie an autochthonous one, which is referred to as the “Basal unit”. There are also occurrences of intrusive rocks of felsic to mafic composition, in the form of stocks, dikes or sills in some places.

The Lavrion district is unique in that five styles of mineralization are spatially associated with each other over an area of approximately 150 km². Primary ore mineralization at Lavrion consist of an enormous number of metallic minerals among them sulfides and sulfoarsenides, native metals, Sn- In-bearing sulfides, various sulfosalts and sulfbismuthines of Ag, Bi, Cu, Pb, As and Sb. Oxidation of the primary sulfides by downward-penetrating water resulted in partial mobilization of elements and their re-precipitation in the form of secondary minerals such as smithsonite, adamite, azurite, malachite, annabergite, gypsum, olivenite, chalcanthite, brochantite, chrysocolla and cuprite. Supergene oxidation resulted among others in replacement of galena by cerussite and anglesite and secondary deposition of the silver-bearing sulfide acanthite. Cerrusite in addition to galena is a major carrier of silver in Lavrion deposit.