

EDITORIAL

The First Geopark in Ecuador: Imbabura.

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DOI. 10.21931/RB/2019.04.01.1

The UNESCO Global Geoparks are created in the nineties as a European regional initiative to respond the increasing need for enhancing and preserving the geological heritage of our planet¹, based on the geological record of determined areas. These geographic sites are part of the evidence of the 4600 Ma of Earth's evolution. This initiative is based on three essential pillars²: preservation, education and geo – tourism designed to reach the sustainable economic development based on the harnessing of the geological heritage. These main thrusts are the guidelines to manage Geoparks, and give the possibility to develop economic and touristic activities which increase the economic income in communities. As a consequence, the settler's life's quality is positively affected.

At the beginning, the Geoparks Network was totally integrated by European members (France, Germany, Greece and Spain)². As the initiative started to be known around the world, other regions showed interest in being part of, and joined to the initiative. Among these are: South America which only had four Geoparks (Araripe in Brazil, Grutas del Palacio in Uruguay, and Comarca Minera and Mixteca Alta in México) until the last week (17th April, 2019) when the Executive Board, United Nations Educational, Scientific and Cultural Organization (UNESCO) decided to give the nomination of Global Geoparks to 7 from 23 candidates, including three Latin American applicants (Valle del Colca and Volcanes de Andagua in Peru, Küttralkura in Chile, and Imbabura in Ecuador). With these new additions, there are 147 members of the Global Geoparks Network distributed in 41 countries³.

Geoparks composed specific geographic areas that show particular and relevant geological features of our planet's history (UNESCO⁴). In South America, and principally in the Andean zone, the evidence associated to the convergence and subduction of the Nazca Plate and South American Plate is well preserved. For this reason, there is a wide variety of natural and geological attractions (ranges of different ages, valleys, volcanoes, geothermal systems, sedimentary basins, faults, rocks, minerals, fossils, etc.). The beauty and the showiness of the region have motivated the launching of various Geopark proposals, for example: Napo – Sumaco in the Amazon Region, Península Santa Elena and Jama – Pedernales in the Coast, Galápagos in the Insular Region, and Volcán Tungurahua and Imbabura in the Sierra Region; all of them, in Ecuador⁵.

Imbabura Geopark occupies all the surface of the homonym province (4,599 km²), and is located in the northern part of Ecuador. Imbabura is surrounded by the Carchi province to the north, Pichincha to the south, Sucumbíos to the east and Esmeraldas to the West. Inside Imbabura Geopark, it is possible to recognize the two mountain ranges, the Cordillera Real and Western Cordillera, separated by the Interandean Valley, all oriented in a general NE – SW direction. These are the principal geological structures that typify the Andean orogeny. The units of the Cordillera Real and Western Cordillera occur to the east and to the west of the Geopark, respectively. The Interandean Valley is the depression located between both ranges. The Geological heritage of the Imbabura Geopark is equally distributed in the ranges as in the Interandean valley. Prominent geoheritage sites are volcanoes



Figure 2. Panoramic view of Cuicocha Lake taken from the north. It is located in the eastern part of the Western Cordillera, 10 km west of Cotacachi city. It was formed through a crater collapse of the Cuicocha dome which is part of the Cotacachi – Cuicocha Volcanic Complex. Inside the crater lake, NE – SW is one of the most important and beautiful geosites of Imbabura Geopark, and it receives the greatest inflow of tourists per year in this area.



Figure 1. Western view of Imbabura Volcano and San Pablo Lake. Both constitute geosites of the Imbabura Geopark, and are located in the Inter-Andean Valley. The Imbabura Volcano is a compound stratovolcano that reaches 4621 meters high, on the summit of Taita Imbabura. In its foothills settle major populations, such as the cities of Ibarra and Otavalo. San Pablo Lake is located south of Otavalo city and its origin is not yet clear. As hypothesis, the glacial origin and the damming by a debris flow from the Imbabura Volcano have been proposed.

(Imbabura Fig. 1, Yanahurco, Cubilche, Cotacachi – Cuicocha), lagoons and lakes (San Pablo Fig. 1, Yahuarcocha, Piñan, Cuicocha), valleys (Chota and Intag), Geothermal complexes (Chachimbiro, Timbuyacu, Nangulví), mineral resources, archeological sites (Urcuquí, among others) and sedimentary basin (Chota),

among others. Due to their scenic beauty, these geosites are mandatory visiting points in the province. For example, Cuicocha Lake (Fig. 1) is one of the most visited geosites in Imbabura, and in northern Ecuador. The rich geological history makes Imbabura a potential area to develop touristic and educative activities, which will guarantee the increase of geotourism. Additionally, it is important to mention that many of the geosites are areas where students and investigators from the School of Earth's Science, Energy and Environment of Yachay Tech, and from other Ecuadorian universities develop academic activities and fieldwork. This academic work is a key component supporting the Unesco Imbabura Geopark.



city, Imbabura. It is a lake of approximately 180 m depth, and 3.5 km of diameter⁷. - SE directed, are two camel-back domes Yeroví (left) and Wolf (right). Cuicocha

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