



MOUNT POPA NATIONAL GEOPARK

KYAUKPADAUNG TOWNSHIP, MANDALAY REGION, CENTRAL MYANMAR



Definition of Geopark

A **geopark** is a protected area with internationally significant geology within which sustainable development is sought and which includes tourism, conservation, education and research concerning not just geology but other relevant sciences. (Wikipedia)

Mount Popa National Geopark

Mount Popa National Geopark is the first National Geopark of Myanmar and it is situated in Popa area, Kyaukpadaung Township, Nyaung U District, Mandalay Region. Mount Popa National Geopark is Composed of (15) Geosites.

The purposes of establishing Mount Popa National Geopark

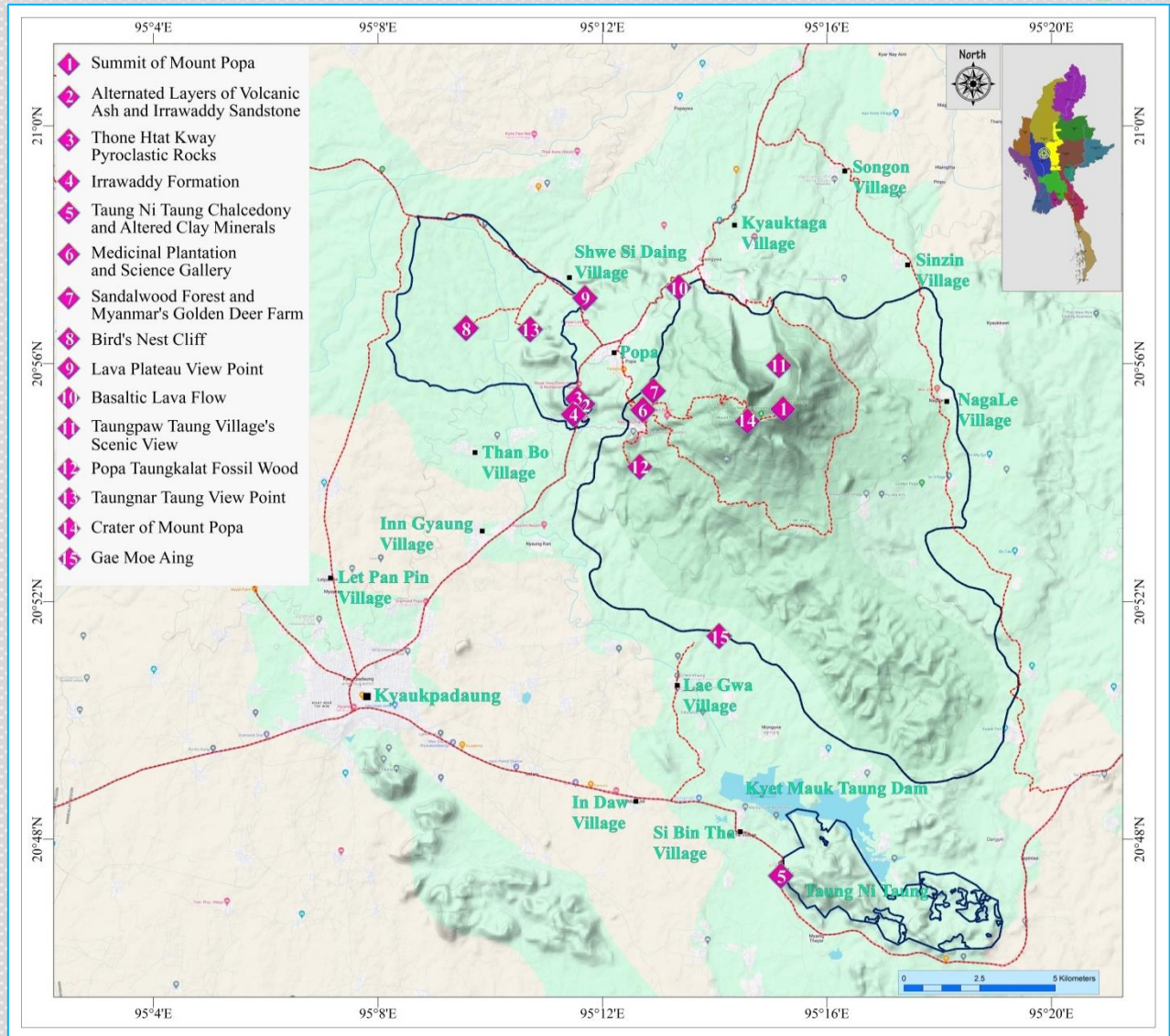
- ❑ To preserve the geological heritage, geomorphology, biodiversity, ecosystems, ancient cultural heritage and natural environment.
- ❑ To inspire the younger generation to actively participate in reducing environmental pollution, engaging in environmental studies, and conducting research.
- ❑ To encourage and promote equitable coordination practices among the local community.
- ❑ To support the sustainable development of the socio-economic life of the local community.
- ❑ To develop the human resources of the local people and sustainable geotourism.

The uniqueness of Mount Popa

- ❑ Mount Popa is a unique geomorphological feature with a horse shoe shape.
- ❑ The beautiful Taungkalat stands as a subsidiary volcanic neck of Mount Popa.
- ❑ It is believed that Taungkalat is home to 37 spirits, and many people visit Taungkalat throughout the year.

Geological History of Mount Popa

- ❑ Lee et al. (2016) estimated that the earliest volcanic eruption of Mount Popa occurred between 10 and 15 million years ago, while Belousov et al. (2018) estimated that the last eruption took place between 8,000 and 10,000 years ago.
- ❑ According to the research of Takashi Sano et al. (2022), the Popa Taungkalat was intruded around 820,000 years ago.



1. Summit of Mount Popa



Hman Pya Taung stands as the pinnacle of Mount Popa, soaring to an elevation of 4,981 feet. At the summit of this mountain, there is a survey benchmark meticulously placed by the Survey Department. Layers of agglomerates with embedded basalt clasts are visible along the route that leads from 4801-foot Saparpon Taung to Hman Pya Taung peak. Notably, solid and compact tuff with a pink-gray color can be found in the vicinity of the Myint Myat Htoo Pagoda, which is located on the Hman Pya Taung peak. From the summit of Mount Popa, one can behold breathtaking scenes, including the impressive Mount Popa crater and the Kyatmauktaung dam. (Geosite Location: 95° 15' 13" E and 20° 55' 13" N)

2. Alternated Layers of Volcanic Ash and Irrawaddy Sandstone



The Irrawaddy Formation, dating back to the Late Miocene to Pliocene ages (approximately 11.5 to 2 million years ago), serves as the substrate beneath which volcanic layers originating from the Mount Popa stratovolcano were deposited. This geological phenomenon is prominently visible in the vicinity of Mount Popa Volcano, particularly in its western region. The alternating layers of volcanic ash and sandstone are evidence of the volcano's multiple eruptions and the Irrawaddy Sandstone deposition during the volcano's dormancy period. (Geosite Location: 95° 11' 37" E and 20° 55' 21" N)

3. Thone Htat Kway Pyroclastic Rocks



Various types of pyroclastic rocks, including hornblende-augite-bearing andesite blocks, agglomerates, and tuffs, are observable within this outcrop. These geological formations are the result of Mount Popa's most violent eruption. This eruption is characterized by the ejection of lava and the explosive expulsion of pyroclastic rocks. (Geosite Location: 95° 11' 33" E and 20° 55' 26" N)

4. Irrawaddy Formation



The Irrawaddy Formation primarily consists of coarse-grained loose sandstone, with cross-bedding features. The age of the Irrawaddy Formation is Late Miocene to Pliocene (11.5 to 2 million years ago). A diverse array of vertebrate and mammal fossils can be discovered within this formation, including elephants, rhinoceroses, wild pigs, cattle, deer, crocodiles, and fossilized wood. Interestingly, interleaving of sandstone and tuff within the formation are prominently visible in the northwestern and western regions of Mount Popa. (Geosite Location: 95° 11' 27" E and 20° 55' 09" N)

5. Taung Ni Taung Chalcedony and Altered Clay Minerals



In Taung Ni Taung, one can readily observe the presence of silica (chalcedony) as well as altered clay minerals such as kaolinite and alunite. It's worth noting that the igneous rocks in Taung Ni Taung are older than the volcanic rocks discovered on Mount Popa. Within Taung Ni Taung, a variety of volcanic materials can be found, including silica-rich tuff, non-silica-rich tuff, and rhyolite. Notably, laboratory results from soil and rock samples obtained from Taung Ni Taung indicate the presence of small amounts of both gold and copper. (Geosite Location: 95° 15' 11" E and 20° 47' 24" N)

6. Medicinal Plantation and Science Gallery



Since 1989, the Forest Department has established a medicinal plantation in Popa Mountain Park, and the public was allowed to visit in 1993. In the medicinal plantation, more than 360 species of valuable medicinal plants are conserved to sustain the growth of medicinal plant species in Popa Mountain Park. Additionally, 86 species of orchids are protected in this location. Information about the plants and animals found in Popa Mountain Park can be acquired at the Popa Mountain Park Science Gallery. (Geosite Location: 95° 12' 38" E and 20° 55' 16" N)

7. Sandalwood Forest and Myanmar's Golden Deer Farm



The sandalwood forest was established by the Nature and Wildlife Conservation Department of the Forest Department. This park covers an expanse of 17 acres where sandalwood trees were planted and protected. In 1957-58, a total of 25 sandalwood trees were planted at a distance of 20' x 20' by the former Forest Commissioner, U Su. The fruits of these sandalwood trees in the park were consumed by birds, which then dispersed the seeds through their feces. As a result, young sandalwood plants grew, and it has now become the sandalwood forest. The native golden deer of Myanmar are also protected in this sandalwood forest. (Geosite Location- 95° 12' 59" E & 20° 55' 20" N)

8. Birds' Nest Cliff



Surprisingly, small holes have been discovered on the 50-foot-high Irrawaddy Sandstone Cliff, located within the sheltered area of the Antawyo stream bend. A variety of local bird species, including sparrows, pigeons, parrots, swallows, and owls, built nests on the surface of cliff by creating small openings with grass and thatch coexisting within these cavities. On the path leading to the cliff where the birds' nests are located, numerous fossilized woods have been found within the sandstone. (Geosite Location: 95° 09' 35" E and 20° 56' 35" N)

13. Taungnar Taung View Point



The Taungnar Taung (Myinka Taung) Scenic Geosite is a distinctive geomorphological area situated on a ridge in the northwestern region of the Popa Lava Plateau. To the north of Taungnar Taung, Ale Taung, and Taung Tachanpet are arranged in a continuous line. The base of Taungnar Taung is predominantly composed of sandstone from the Irrawaddy Formation, which includes fragments of fossilized wood. In contrast, the upper portion of the mountain consists of volcanic pyroclastic rocks. These volcanic rocks are concealed beneath a broad, flat lava plateau, approximately 20 feet thick, which is made up of fragments of agglomerates, tuff, and andesite. Originally, Taungnar Taung and other smaller hills were connected to the Mount Popa Lava Plateau. However, they have become isolated hills over time due to the erosional processes of streams. The summit of the mountain supports a diverse range of plant species that thrive in this unique environment. (Geosite Location: 95° 10' 49" E and 20° 56' 38" N)

9. Lava Plateau View Point



Lava Plateau View Point is a beautiful geomorphological geosite. The distinct positions of the lava flow, the point where the lava ceased, and the landscape of the volcanic lava plain with its flat terrain can be seen from this location. In particular, the rhyolitic lava, known for its high viscosity, often accumulates in a dome-shaped mass near the volcanic vents. In contrast, andesitic lava, which possesses moderate viscosity, tends to cool at a somewhat greater distance from the vents. Lastly, basaltic lava, with its low viscosity, can flow over long distances before cooling. It's worth noting that the lava type prevalent at this site is basaltic lava, contributing to the unique geological spectacle on display. (Geosite Location: 95° 11' 30" E and 20° 57' 21" N)

10. Basaltic Lava Flow



During the active phase of Mount Popa volcano, basaltic lava flowed from the volcano's crater towards the west and northwest. The trajectory and strata of this lava flow are distinctly visible in Google Earth imagery. Basalt, an extrusive igneous rock, is the primary component of this geological formation. It is commonly encountered in volcanic regions and expansive basalt plateaus. Basalt with a notable presence of olive-green-colored olivine minerals is classified as olivine basalt. In the vicinity of Mount Popa, olivine basalt is prominently observed within the northwestern stretch of the volcanic lava flow. According to dating analyses, this particular basalt has an age of approximately 0.15 million years (Lee et al., 2016). Furthermore, the surroundings of the basaltic lava flow site also feature Pozzolan and Lapilli Tuff formations, adding to the geological diversity of the area. (Geosite Location: 95° 13' 10" E and 20° 57' 21" N)

14. Crater of Mount Popa



During the most violent eruption of Mount Popa volcano, the northern part of the mountain experienced a significant blowout, resulting in the outflow of lava and the formation of a horseshoe-shaped crater. Subsequent eruptions, characterized by less intense lava and volcanic ash, led to the preservation of the current landscape. In the vicinity of the Mount Popa crater, three mountains are arranged in a triangular position, with the current location situated between Sapparpon Mountain and Say Mway Mountain. The crater consists of pyroclastic rocks, including agglomerates and tuff. The lower valley within the crater serves as the habitat for endangered species like the Popa Langur (a long-tailed monkey) and various other wildlife, including deer, barking deer, raccoons, and a diverse array of bird species. (Geosite Location: 95° 14' 31" E and 20° 55' 10" N)

Benefits of establishing the geopark

- ❑ Capable of conserving geological heritage, biodiversity, ecosystems, and ancient cultural heritage.
- ❑ Local residents and students can engage in studying, gaining knowledge, and conducting research activities within the geopark.
- ❑ Able to inspire local residents to preserve their area's natural and ancient cultural heritage.
- ❑ Able to promote sustainable geotourism and improve the socio-economic conditions of the local community.

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11. Taungpaw Taung Village's Scenic View



The scenic view of Taungpaw Taung village is located on the northern part of Mount Popa, right along the path of past volcanic eruptions and surrounded by the remnants of pyroclastic flows and volcanic debris. It also serves as an excellent vantage point to admire the horseshoe-shaped crater to the north of Mount Popa and the old open-pit mining site for Pozzolan (volcanic Ash) in the northwest of Taungpaw Taung village. There is a Taungtwin Chaung Camp where the rare Popa Langur (long-tailed monkey) (*Trachypithecus popa*), recognized as a globally unique species, are protected in the Crater Valley. It takes approximately 45 minutes to reach the camp on foot from Taungpaw Taung village. From this camp, you can enjoy a breathtaking view of the Crater Wall of Nwalabo Mountain, one of the eastern peaks of Mount Popa. (Geosite Location: 95° 14' 42" E and 20° 57' 09" N)

12. Popa Taungkalat Fossil Wood



The Popa Taungkalat fossil wood site is home to a range of fossilized wood specimens with different sizes. These fossilized woods are predominantly found within the yellowish-brown sandstone of the Irrawaddy Formation, both in scattered vegetated form and sectioned pieces. Among them, the largest fossil wood measures approximately 10 feet in length and 3 feet in diameter, often embedded within the sandstone. Along the way to the fossil wood site, outcrops of white-colored tuff, a result of volcanic eruptions, can be encountered. (Geosite Location: 95° 12' 29" E and 20° 54' 19" N)

15. Gae Moe Aing



The rocks in the vicinity of Gae Moe Aing (local name) consist of Late Miocene to Pliocene-age (approximately 11.5 to 2 million years ago) sandstone from the Irrawaddy Formation and Holocene-age tuff. Gae Moe Aing itself is a geological feature resulting from the swift flow of the local stream (Htaelae) and its erosion of Lapilli Tuff, formed by the eruption of the Popa volcano. This location exhibits distinctive geomorphological characteristics due to the infilling of water-carrying rocks into erosion pits and the erosion of the underlying volcanic rocks. Evidence of erosion and weathering of volcanic rocks, including Let Ngar Chaung Aing (a lake with a five-finger shape), Gae Moe Aing (a lake covered by a large rock), circular or cylindrical potholes, Kyauk Ta Lone Aing (a rock-shaped lake), and rock ravines, can be observed. Both Let Ngar Chaung Aing and Gae Moe Aing were sculpted by the rapid flow of Htaelae's stream current, while Kyauk Ta Lone Aing formed as tuff deposits filled potholes. Potholes, characterized by circular or cylindrical holes in the stream bed (composed of volcanic tuff), result from the forces of water and abrasion. (Geosite Location: 95° 13' 5" E and 20° 51' 29" N)