The Barren island volcano is situated around 140 km northeast of Port Blair, the capital of Andaman & Nicobar Islands. It is a 354 metre high island rising from a depth of 2,250 m.

This small 3 km wide island contains a roughly 2 km wide crater with walls 250-350 metres high. It is partially filled with cinder cone (a cone formed round a volcanic vent by fragments of magma tossed out amid emissions) that has been a source of historical eruptions since the first recorded eruption in 1787. Since then, the volcano has disgorged more than ten times, with the latest being in 2017.

The Barren island is built of prehistoric lava flows. The Andaman basin is known for its strong seismic and hydrothermal activities and has many submarine volcanoes. This volcanic island stands in the midst of a volcanic belt on the edge of the Indian and Burmese tectonic plates and is related to the subduction of the northeast-moving Indian plate underneath the Burmese plate along the Andaman trench.

A team of researchers from CSIR-National Institute of Oceanography (CSIR-NIO), Goa, reported 2017 that the Barren island is active and spewing smoke and magma once again. The team collected and examined samples from the sea floor in the Andaman Basin near the Barren volcano when it began spewing ash and recovered coal-like black pyroclastic material. The collected samples will help to
explain the nature of the past and present activities in the area by examining the ash layers in a sediment column.

The island is named Barren Island because it is uninhabited and devoid of any significant vegetation. The primary living creatures found on this island, aside from certain equatorial plants and trees, are feral goats, birds, fruit bats, flying foxes, parrots and certain types of rodents.

Scarcely any human can live here as it is devoid of any source of livelihood, apart from the continually looming threat of volcanic ejection.

However, despite the peril of sudden volcanic emissions, it is a frequently visited destination. It is one of the best spots for scuba diving in the Andaman and Nicobar archipelago. It has well known for the uncommon type of Manta Rays (giant species of flattened fish), fast growing coral gardens, basalt arrangement of interesting shapes and the topographic formations made by magma streams amid prior volcanic ejections. The Island is known to have a unique underwater black sand landscape, walls and drop offs, gorgonian fans and pelagic.

Volcanology and eruptive styles of the Barren Island volcano provide clues to what the volcano can be expected to do in the future. The Barren island active volcano is a unique landmark in India and its eruption is a sign of truly dynamic geology.