The preliminary interpretation of geological and geochemical data indicates the monogenetic volcanoes of Bajawa associated with tholeitic magma derived from tectonic setting of Indian-Australian plate from the south, interpreting a presence shallow magma chamber. Monogenetic volcanism represents a singular type of volcanic eruption. In Bajawa, the monogenetic volcanoes are located in a volcanic complex associated with three polygenetic active volcanoes at the surrounding, Ine Rie, Ebulobo, and Ine Lika, which was erupt in 2001. The monogenetic volcanoes are located on volcanic terrain between 600-1600 m above sea level, with having K/Ar and $^{14}$C ages of the volcanic rocks range from 0.6 - 0.01 Ma, indicating Pliocene to Holocene volcanic activities. Three fumaroles are shown and associated with Wolo Bobo, Wolo Belu and Wolo Inelika, having produce steam vents with range temperatures 80 to 100°C, assuming a high temperature volcanic gases at depth. The geology of the area shows most of spatter cones associated with lava and pyroclastic materials, comprising mainly of andesitic to basaltic composition. They derived from sub-aerial, as shown by Wolo Bobo, Manulalu and Belu. A carbon dating of charcoal from Wolo Bobo airfall deposits had an age of 0.01Ma, indicating a very young volcanic activity, and perhaps a shallow crystalline magma beneath the Bajawa volcanic areas.

Key words: monogenetic volcanoes, tholeitic magma, andesitic, young ages, shallow magma chamber