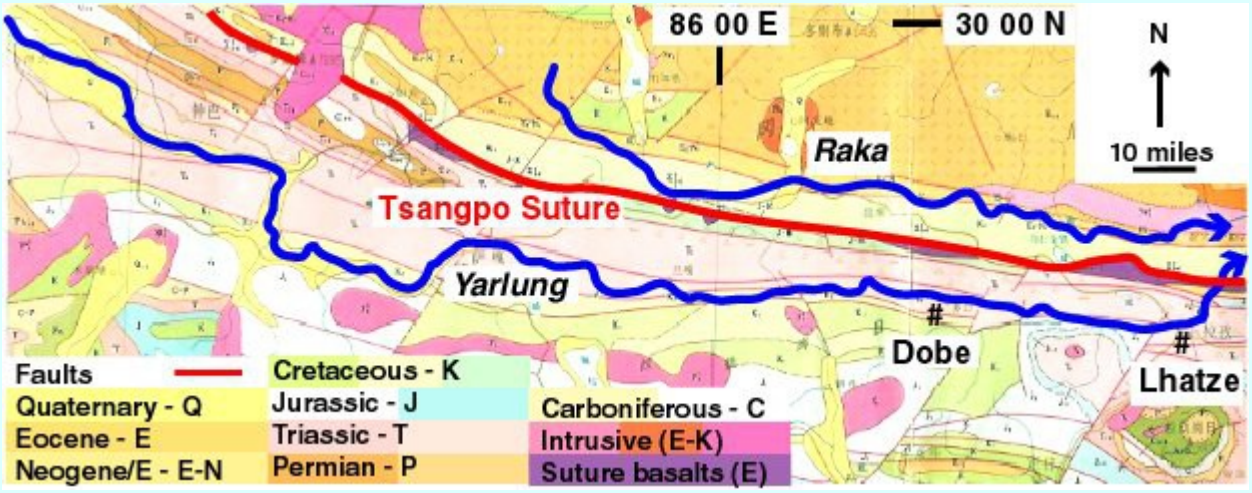
Geology and Geography of the Yarlung Tsangpo Headwaters Area

Geologic Map of the Yarlung Tsangpo Headwaters Area



Map produced by the Chinese Ministry of Geology and Mineral Resources
Original scale 1:1,000,000

The Yarlung Tsangpo is the headwaters of the Bramaputra River of eastern India. The headwaters are located in the southwest part of the Eocene block of Tibet, generally following the Tsangpo Suture. The headwaters area is characterized by extensively faulted and metamorphosed Paleozoic, Mesozoic and early Cenozoic sedimentary rocks which have been intruded by Eocene granitic rocks. Faults are generally oriented NW-SE, E-W and NE-SW. The Tsangpo Suture is a thrust fault representing the Eocene boundary of the Indian and Asian plates, with subsequent right lateral strike-slip displacement. The average elevation is about 17,000 feet, typical of the western Tibetan Plateau.

Paleozoic and Mesozoic rocks occur in NW-SE to E-W elongated fault bounded blocks. Paleozoic rocks represent offshore marine limestones deposited before subduction of the Tethys oceanic crust. Mesozoic sediments were deposited on the southern margin of the Asia block during subduction of the Tethys oceanic crust and prior to the collision between the Indian and Asian continents. North of the Tsangpo Suture, a large sheet of Eocene clastic sediments unconformably overlies these rocks. These sediments were derived from the volcanic highlands during the early stages of collision. Late Eocene granitic rocks represent the low melting temperature fraction of subducted oceanic basalt and Indian continental crustal rocks.

King Tiger Hotsprings north of Raka, indicating continued heat flow from India's collision with Asia. An attempt to develop them failed. Photo by Travis Winn

View of the Tsangpo where it ponds above Kanglai Gorge, with large sand dunes in the foreground and Anapurna (8091m or 26,538') in the background. In the upper river valley, the river bed is filled with glacial gravels and with the exception of Kanglai Gorge upstream from Dobe, rapids are rare.
Photo by Travis Winn

Just downsream from Dobe, the river enters Renqinding Gorge, which constricted the river at the end of the last ice age (10,000 years ago) and caused ponding and the deposition of lake sediments as illustrated in this photo. Underlying gravels form benches along the river which are sometimes three hundred feet thick and wide and flat enough for villages and fields, as seen in the photo below. Also note erosion of the colluvial fan above the village, due in part to overgrazing.

Photo by Steve Swann