

Afar field trip preliminary report – August 20, 2007

Field team - (Dr. Gezahegn Yirgu, Dr. Atalay Ayele, Dr. Shimeles Fisseha, Dr. Tadiwos Chernet and Ato Kifle Damtew)

The team left Addis on Thursday morning and stayed the night in Dire Dawa. Field observation with the help of a military helicopter was possible on Friday afternoon, August 16, 2007, for about two and half hours. Ground investigations were limited by very hot and humid weather conditions, very rough topography and security concerns.

The locality where volcanic eruption took place was easily reached using coordinates previously obtained from David Pyle. According to pastoralists, the locality is known as **Karbahi** (Figure 1). Prominent features in the area include Gommoyta and Diyyilu felsic volcanoes (from the CNR-CNRS geological map), which are found immediately to the north of this locality. Karbahi is the name given to the axial segment/ graben with numerous active normal faults, fissures and recent basalt flows and bounded by prominent large normal faults on either side.

Aerial observations showed the following active features:

1. Isolated spots where intense emission of gas (with distinct smell of sulfur dioxide) is taking place. In few places white- and yellowish deposits of sulfur are visible.
2. Long, discontinuous, emissive fissures, arranged en echelon, from which lavas have flowed on either sides, predominantly west to the graben floor. Numerous small spatter and scoria cones are aligned on the fissures. Reddish glow and rare flames are also observed on top of some of the tiny craters of these cones.
3. Fault scarps with fresh breaks and rock falls are visible, probably showing evidence of recent movement. A narrow graben-like collapse structure oblique to one of the fissures was also observed.
4. The segment affected by tectonic and volcanic activity is estimated (with the help of the helicopter pilot) to measure some 5 to 7 km long and 1 km wide.

Ground investigations revealed the following:

1. Basalt lavas, emitted from long fissures, flowed on either side of the fissures predominantly to the west into the graben floor. Immense heat is felt emanating from beneath the flows while walking on top of the lavas, which appear to be cooling. Each fissure is covered by a continuous row of small and closely spaced spatter and scoria cones. Many of the cones themselves have tiny pits from which heat and gas is being emitted. The pits are too hot and too suffocating (sulfur smell) to access. Reddish glow and flames have been observed from some distant cones. One fissure with its row of cones is oriented ~ N 7-10° W.
2. Effusive lava is basaltic and of the aa and ropy types. Observed flows are relatively viscous and have not traveled beyond a few hundred meters from their fissure vents. Overall thickness of flows is variable and reaches several meters in places. Lava channels and tubes are abundant. Representative lava samples have

- been collected at the following GPS locations: 12° 15.92'N, 40° 39.138'E (470m altitude); 12° 16.053'N, 40° 39.059'E (472 m elevation)
3. Spatter ramparts and scoria cones vary in height from 2 to 10 meters. Spatter and scoria fragments vary from coarse lapilli to bombs.
 4. New basaltic lava is moderately porphyritic with small and sparse plagioclase phenocrysts. Older lavas exhibit the same features.

Local pastoralists provided the following eyewitness accounts.

1. There was no activity of any kind during the days preceding the eruptions.
2. The first sign of activity was noted on Sunday August 12, 2007 when a sudden heavy cracking sound was heard in the affected area. The sound was heard first in the northern part and propagated continuously southwards. Only a small ground tremor was felt at this time.
3. On Monday August 13, 2007 at about 5:30 PM, "fire" started to be seen from the north in the direction of Gommoyta and continued to the south lighting up the entire area. Fire and smoke rose high up into the sky in the area (curtain of fire) and this activity continued with variable intensity until it subsided out on Thursday morning.
4. People were scared and left the area and therefore did not see lava flowing out of the fissures or cones.
5. So far no damage on life and property reported.

While in Semera, the team held fruitful discussions with authorities of the regional government and agreement was reached to jointly organize a one-day workshop in Semera in early September to present and discuss matters related to geohazards. The team also gave briefings on its findings to the media, namely the Ethiopian News Agency and Walta Information Center.

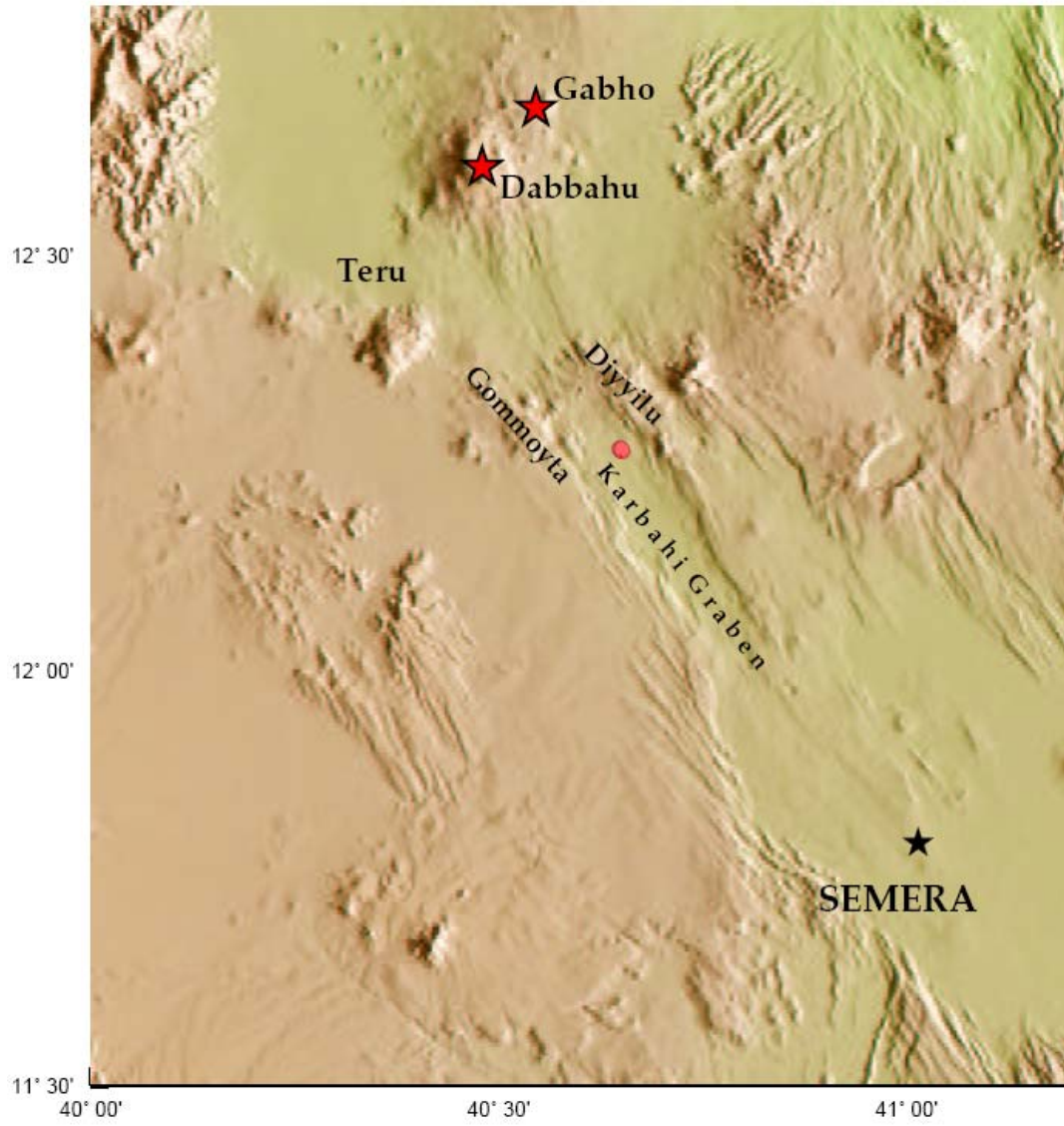


Figure 1. Location of the *Karbahi* fissure eruption



