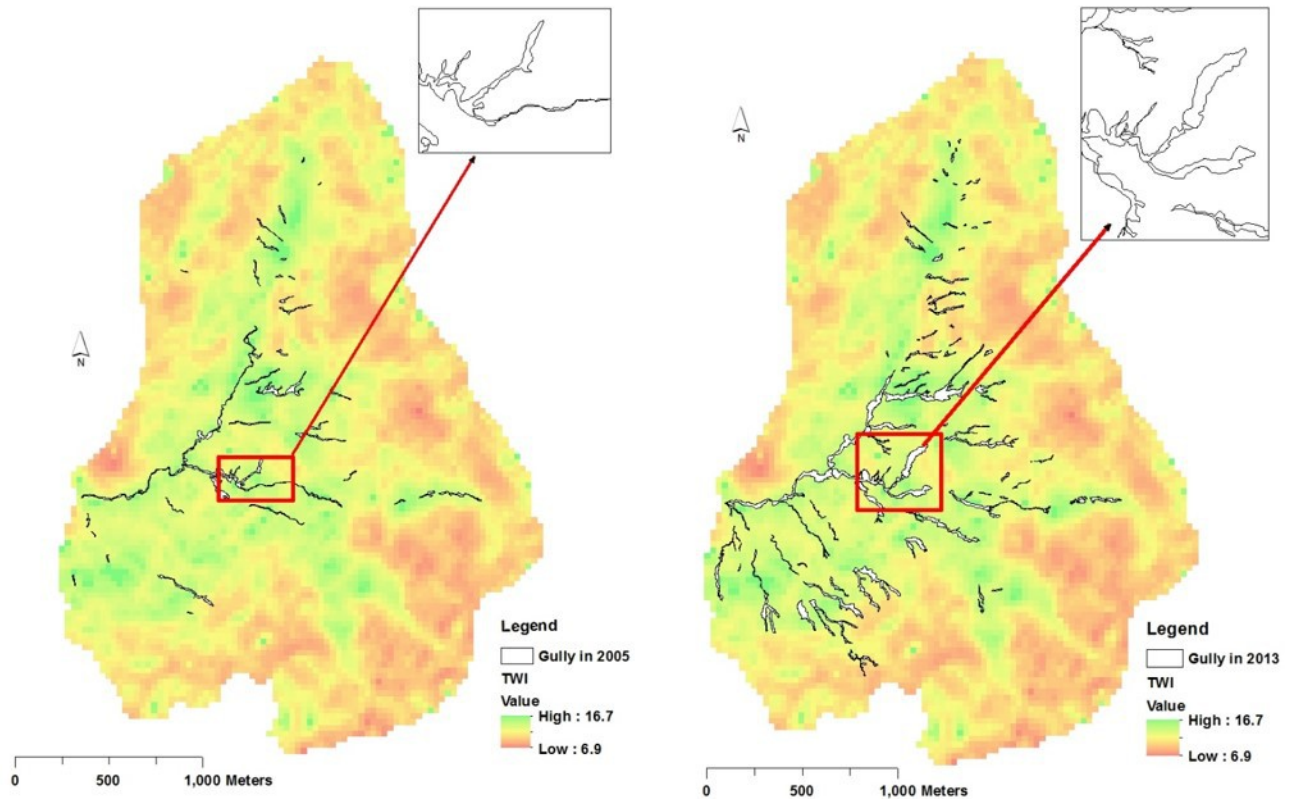


Figure S1. a) The measured volume versus gully surface area for the 13 gullies. The regression equation obtained from this relationship was used to estimate the volumes of all gullies in the Deebre Mawi watershed presented at Table 1 in the manuscript, and Table S1, in the supplementary table, whose surface



areas were digitized from Google in 2005 and 2013, (b) the predicted volume using the equation in (a) or Eq. (4) in the manuscript, versus measured volume of the 13 gullies.

Figure S2: The relationship between gully formation locations and topographic wetness index (TWI), and gully expansion rate between (a) 2005 and (b) 2013 in the Debre Mawi watershed, Ethiopia. Lines represent gully edges digitized from aerial imagery.



Figure S3. The picture shows that bank layers near the bottom were more erodible than the overlying layer, causing a preferential retreat that undercut the bank and consequent cantilever failures. The picture was taken at the headcut of gully G8 in July 2013.