



**FIGURE 4** The threshold line that represented the gully topographic thresholds (the relationship between the slope at the gully head ( $s$ ) and the upslope drainage area ( $a$ )) of the gully heads at the main study gully. The threshold lines that represented gully heads in each of the 5 study catchments in the Rift margin sub-area (12 gully heads for 1957, 16 for 1972, and 8 for 2005 without outliers; (a)) and the 7 study catchments in the Valley bottom sub-area (17 for 1957, 6 for 1972, and 34 for 2005 without outliers; (b)). The gully topographic threshold values were shown in different colours that represented the period when the gully head incised: red; before 1957, green; 1957–1972, black; 1972–2005. (c) The threshold lines that represented all the gully heads incised during the 3 periods (red lines; before 1957, green lines; 1957–1972, black lines; 1972–2005) in the two sub-areas. (d) Threshold lines that represented the land use items around the position of the gully head (forest, grassland, and farmland) in the two sub-areas. Outliers (2 data for the Rift margin and 3 data for the Valley bottom) were rounded by solid red lines in (a) and (b). Four data rounded by red dot-line in Figure (a) are the gully heads that incised at the middle or lower reaches of the Rift Margin catchments before 1957. Three data rounded by red dot-line in Figure (b) are the gully heads of Hadaware main gully that had over 1.5 km<sup>2</sup> upslope drainage areas before 1957