



FIGURE 1.6 Aerial view of the confluence of the Quijos River (lower left) and the Salado River (upper left) to form the Coca River (flowing to the right). Postearthquake braided debris-flow and flood deposits are as much as 15 m thick in the valley bottoms. Bedrock constriction of the Coca River (indicated by two arrows near right edge of photo) probably caused short-lived damming of the river, which contributed to upstream flooding and rapid sedimentation. Note landslide (single arrow near center of photo) that badly damaged the Salado pumping station on the Trans-Ecuadorian oil pipeline.

Widespread stripping of saturated surficial materials and jungle cover from steep slopes by earthquake shaking similar to that which occurred in the Reventador area in 1987 has been noted in other humid tropical areas in a few similar catastrophes in this century. In September 1935, two shallow earthquakes ($M=7.9$ and $M=7.0$) in the Torricelli Range on the N coast of Papua New Guinea caused “hillsides to slide away, carrying with them millions of tons of earth and timber, revealing bare rocky ridges completely devoid of vegetation” (Marshall, 1937). Approximately 130 km^2 (8 percent of the region affected) was denuded by the landslides (Simonett, 1967; Garwood et al., 1979). Materials from the slides flooded the valleys, and, in some cases, blocked major rivers (Stanley, 1935). In November 1970, an $M=7.9$ earthquake, which was located along the N central coast of Papua New Guinea, triggered landslides that removed shallow soils and tropical forest vegetation from steep slopes in the Adelbert Range (Pain and Bowler, 1973). About 25 percent of the slope areas in the 240-km^2 area that was



FIGURE 1.7 NE (left) valley wall of the Malo River, showing extreme denudation of slopes due to slips/avalanches/flows caused by the March 5, 1987, earthquakes.