20th-Century Urban Landslides in the Basilicata Region of Italy

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ABSTRACT / The geology, relief, neotectonics, climate, and vegetation of Basilicata make the region vulnerable to landslides, but the number of reported landslides in the region has increased over recent centuries, and this has been interpreted as a result of changes in land use. This interpretation is confirmed by documentary evidence presented in this article (concentrating on the example of the town of Grassano, where urban landslides are an almost exclusively 20th-century phenomenon), which shows the increase in landslides to have been real, rapid, and caused by humankind.

Traditionally, environmental phenomena such as landslides have been perceived as "natural," affected only marginally by humankind. This article acknowledges the complexity of the physical processes that cause landslides, but notes that although landslides are physical phenomena, the growing technological and organizational ability of humankind to influence the environment has made them increasingly subject to modification and triggering by humankind. Consequently, phenomena like the urban landslides that affect much of the Basilicata region of Italy cannot be understood adequately without an analysis of the historical, political, economic, and ecological context in which they exist (see Hewitt 1983, Blaikie and Brookfield 1987).

This article begins by explaining the severity of the landslide problem in Basilicata, and examines the physical factors that make the region vulnerable to landslides. Then, it briefly reviews the evidence that environmental degradation (and consequently landslides) has increased over recent centuries, and the inferential evidence that this is because the recorded changes in the use of the land in Basilicata have modified many of the physical factors that cause landslides. The article shows that these sources lack firm data and consequently can provide no definite proof that these changes occurred because of humankind.

Archive evidence collected for this paper shows that there has been a real increase in the number and severity of urban landslides affecting Basilicata during the 20th century. Consequently, this article concludes that the change has been so rapid that it could only have been the result of those social changes affecting the region that have led to what Blaikie (1985, p. 125) identified as "marginalization." Marginalization is the process by which peasants in lesser developed countries "lose the ability to control their own lives" through the disruption of their farming system by its incorporation into the world economy.

The Scale of Landslides

As a result of the widespread soil erosion and landslides that it experiences, Basilicata has been described as "the most degraded region of southern Italy" (Kayser 1961, p. 5). In its territory of 999,200 ha, a recent survey has detailed nearly 1800 deep landslides with a total area of 26,000 ha (Cassa per il Mezzogiorno 1984). In total, 184,000 ha are affected by erosional phenomena, superficial landslides, or solifluction. Urban landslides had become an almost ubiquitous problem by the 1980s, with 81% of the town centers of the region's 131 municipalities reported as affected by landslides (Lazzari 1986).

The Vulnerability of Basilicata to Landslides

Most of Basilicata is vulnerable to fluvial dissection and landslides as a result of its geology, relief, neotectonics, seismicity, climate, and vegetation (Regione Basilicata 1987). At least 54% of the region is underlain by fine-grained cohesive sands and 19% of the region by overconsolidated marine clays (Alexander 1982). Relative relief, dominated by the Apennine chain, is generally steep, with 70% of the land classi-
fied as mountainous and 22% as hilly (Ranieri 1972). Neotectonic uplift and eustatic adjustment have led to significant rejuvenation (Cotecchia and Magri 1977, Neboit 1981), and intense seismicity has caused many mass movements (Cotecchia and Meldoro, 1974). The warm-temperate climate, with summer drought and winter downpour, promotes torrential streams, gullying, and landslides (Puglisi 1977). Where the natural vegetation has been cleared, gullying is widespread (Kayser 1961).

The Evidence for an Increase in Landslides

Comparability between the number of current and past landslides is difficult for reasons made clear by the historiographical research of Pedio (1964). There was a tendency that was persistent throughout the feudal period to understate both social and environmental problems. Descriptive evidence is consequently not as reliable as it could be, but, based on the works of the 18th-century writer Galanti, Boenzi (1974) concluded that the level of degradation in Basilicata had not changed significantly between the 18th century and the late-20th century.

Yet there is a considerable weight of evidence suggesting that environmental degradation—and, by implication, landslides—has increased in historic times (Monticelli 1841, Marsh 1864, Ciasca 1928, Tichy 1957, Vita-Finzi 1969, Alexander 1982, Brückner 1983, 1990). The evidence provided by these writers implies that in recent centuries environmental degradation in Italy has become more widespread than in the Classical period. In his review of reported changes across the Mediterranean, Vita-Finzi (1969, p. 39) described the range of changes as follows:

Rivers that were navigable in Classical times, and in some cases as late as the sixteenth century, have silted up. The course of lowland streams has altered and continues to do so. Former ports—notably Ostia—now lie inland as a result of deposition at their mouths. Indeed, many Italian deltas have formed almost entirely in historical times...

Landslides have been recognized and recorded as a problem in parts of Italy since the 16th century (Brückner 1976, Delano Smith 1979), and in Basilicata since the 17th century (Boenzi 1974). Factors such as damage to the road network have frequently caused economic dislocation in Basilicata (Racoppi 1902), and exceptional events have led to significant losses of life and property: notably, the disastrous landslide of 1688 in which part of the town of Pisticci was destroyed and more than 400 people were killed (Guericchio and Meldoro 1979, p. 124).

If the time when this degradation occurred can be determined, some inferences can be made about its causes. Was it principally, as Vita-Finzi suggested, the result of climatic changes at the end of the medieval period, or was it principally the result of the human impact on the land which has continued into this century? Evidence presented here shows that although landslides have always affected Basilicata, there has been a significant increase in the number of reported landslides since the 18th century: this increase has been in part an apparent trend caused by more assiduous reporting, but in part it has also been a real trend caused by changes in land use.

Changes in Land Use and Their Effects on Landslides

Brückner (1983, 1990) cited sediment data from the terraces of the rivers Cavone and Bradano showing that there have been four periods of valley alluviation that have affected Basilicata during the Holocene. The first was during the late Pleistocene to early Holocene; the second from about 700 BC to 200 AD; the third from the 8th century AD to the 11th–12th or 14th–15th centuries; and the fourth from the 19th to the early-20th century.