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## Fluvial landforms as a constrain to urban development of Benevento (southern Italy)

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The city of Benevento is located in an intramontane Plio-Pleistocene basin of the Campanian Apennines (Southern Italy), at the confluence of the Calore and Sabato Rivers. Most of the city lies on different orders of terraces, while the more recent settlements are located on summits and flanks of hilly relieves. The terraces, as confirmed by both literature and field surveys, have an alluvial origin and a lower Pleistocene to upper Pleistocene age. The substratum of these terraces mainly consists of conglomerates with sandy intercalations. There are also limited outcrops of silty-clayey sequences with sandy-gravelly intercalations, interpreted as results of fluvio-lacustrine sedimentary episodes. The scarps between the different orders were probably smoothed artificially over time, also using the rubble produced by earthquakes, which are still intense in this area. On the slopes that border the recent alluvial plain, landslides are frequent, especially on north-facing slopes. The most recent alluvial terraces are not older than Holocene. The substratum of these terraces consists of gravels and sands with interbedded tephras and paleosols. Currently, the main fluvial landforms are the single-thread channels with small-sized bars and fluvial islands of the Calore and Sabato Rivers. The geomorphological analysis, based on GIS-based comparisons of historical maps and aerial photos from different dates and supported by field data, also shows several inactive fluvial landforms, such as abandoned channels, degraded fluvial scarps and summits of river terraces, together with an intense channel narrowing. Probably, the first stable settlements of Benevento, dated back to the Archaic and Classical age, were located on the floodplains of the Sabato and Calore rivers. This allowed the exploitation of water for agro-pastoral purposes. When there was the need to organize more structured settlements, also protected from both frequent floods and military attacks, the population moved upward to the middle-upper Pleistocene aged alluvial terraces. The first settlement was probably built in the 5th century B.C. and subsequently expanded during the Roman and, then, Longobard ages. The water supply in the most elevated areas was made by a series of artificial canals built along the southern slopes of the surveyed area, prepared with suitable terracing. On the northern side, in a recently restored monumental complex dated back to the VI-VII century, the effects of a series of catastrophic events (i.e., floods and earthquakes) that affected this area can be recognized in the materials preserved there. For centuries, a clear subdivision in the land use was maintained. Namely, rural areas were located on the plain and surrounding slopes, while residential areas were located on the most elevated terraces. However, during the twentieth century, a transformation gradually occurred due to a significant demographic increase. The urban environment quickly occupied large agricultural areas, despite the fact that these areas were subject to frequent flooding, which caused extensive damage and even fatalities. In order to protect them, therefore, impressive bank works were carried out on the rivers, but in other cases the lack of care of farmers still makes difficult any recovery and mitigation intervention.