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### The effects of land use on runoff and soil nutrient losses in a gully catchment of the hilly areas: implications for erosion control

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Serious soil erosion is one of the major issues threatening sustainable land use in semiarid areas, especially in the Loess Plateau of China. Understanding the effects of land use on soil and water loss is important for sustainable land use strategy. Two sub-catchments: catchment A (CA) and catchment B (CB) with distinct land uses were selected to measure soil moisture, runoff and soil nutrient loss in Da Nangou catchment of the Loess Plateau of China. The effects of land use patterns on runoff and nutrient losses were analyzed based on soil moisture pattern by kriging and soil nutrients using multiple regression model. The results indicated that there were significant differences in runoff yield and soil nutrient losses between the two sub-catchments. With similar land uses, the CA produced an average sediment yield of 49 kg ha<sup>-1</sup> and 22.27 kg ha<sup>-1</sup> during two storm events. Meanwhile, there was almost no runoff in the CB with dissimilar land uses during the same events. Buffer zones should be established to re-absorb runoff and to trap sediments in catchment with similar land use structure such as the CA. Moreover, land use management strategy aiming to increase the infiltration threshold of hydrological response units could decrease the frequency of runoff occurrence on a slope and catchment scale.

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**关键词:** soil erosion; runoff; soil nutrient; land use pattern; the Loess Plateau of China doi: 10.1360/gso50402