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Evaluation of soil quality in different land uses in the Mengzi Gabin Basin, Southwest of China

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Re-vegetation has been widely carried out to prevent land degradation, reduce soil erosion, and improve soil quality. In order to investigate the characteristics of soil nutrients content in different land use types of karst gabin basin, soil organic matter, soil total nitrogen, soil total phosphorus, soil total potassium, soil pH, and soil texture in woodland, agricultural land, orchard, and grassland were surveyed in Mengzi Gabin Basin, Southwest of China. The difference of soil indicators between vegetation types was analyzed, and soil fertility quality of four land use types was comprehensively evaluated by the soil quality index (SQI). The results showed that land use significantly affected soil organic matter content. Soil organic matter content was the highest in grassland, followed by agricultural land and forest land, while orchard was lowest. There was a significant difference in soil total nitrogen content between different land uses. The total nitrogen content in farmland soil was the highest, followed by grassland and woodland, and the lowest in the orchard. Woodland had the highest total potassium content and the lowest total phosphorus content. The grassland soil had the highest total phosphorus content and the lowest total potassium content. pH value in the four land use types was acidic, ranged from 5.82 to 6.67. The soil quality index showed that woodland had the highest soil fertility quality. The results of the study could provide the basis of soil nutrients variation and status in Gabin basin, and also provides support for evaluating the soil improvements during vegetation restoration in fragile Karst ecosystems.