Changes in land use and management strongly affect the physical and chemical properties of soils and their ecological functions. Especially, regions in East Africa have experienced dramatic land use changes in the past, but the spatial variability of soil properties and the impacts associated with those changes have been rarely documented. We investigated changes of major soil physical and chemical parameters along a gradient from hillslopes covered with forest and pasture, to the plains dominated by agriculture and savanna grassland in the upper Lambwe Valley in western Kenya. Additionally, we analyzed soil properties within a fenced area on the hillslopes in order to identify potential soil recovery effects after the exclusion of livestock grazing. We showed that topography, geological background, and soil formation processes were the primary controlling factors for variations in soil depth, the amount of rock fragments, and the textural composition of the soils. Agricultural cultivation strongly increased bulk densities and reduced hydraulic conductivity and plant available water capacity due to tillage-induced subsoil compaction. Intensive livestock grazing also increased bulk densities and negatively affected hydraulic properties although less strongly pronounced than the impacts of agricultural cultivation. Carbon and nitrogen levels were significantly lower in farmed and pasture soils compared to the forested hillslopes. For the exclusion of grazing, however, we did not observe significant differences in soil physical and chemical parameters as fencing has been maintained for few years only and natural soil recovery is a long-term process. This study provides quantitative information on the spatial distribution and variability of soil properties associated with different land use and management systems in the upper Lambwe Valley and will be of use for future research on ecosystem processes in this region. However, additional soil survey campaigns will be required to create a complete picture of the soil landscape for the entire area of the Lambwe Valley.