

## **Comments on Namwanyi et al. Trapnell's Upper Valley soils of Zambia: the production of an integrated understanding of geomorphology, pedology, ecology and land use**

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Namwanyi *et al.* (2024) review at length the information on the soil of Zambia from the 1920s to present day. They focus on the legacy of C.G. Trapnell (1907–2004) whose ecological surveys of the territory from 1932 to 1943 included a wealth of information, not only on the vegetation but also on the soil, traditional agricultural practice and their variation from place to place. The vast Central African plateaux are mantled by thick residues of weathered rock that have remained in place perhaps since Tertiary times. This ancient oligotrophic soil now lacks minerals that can weather further to release plant nutrients. At the plateau margins, the land has been bevelled by erosion as streams cut back from the Luangwa and Zambesi valleys and the down-warped Kafue Flats. This erosion on a geological time-scale, so-called 'normal erosion', removed the ancient residues to leave relatively rich soil. Trapnell recognized this contrast; he called the bevelled margins 'Upper Valley'. The rich soil bore savanna vegetation quite different from the miombo woodland of the plateaux. Trapnell recognized that it had agricultural potential far greater than that of the plateaux, and he reported this to the government of the day.

In due course the government acted; it commissioned a soil survey of one large area of Upper Valley in Zambia's Eastern Province, and it fell to me to do it. Like the authors of this paper, I realized that Trapnell's distinguishing the Upper Valley soils from those of the plateaux on physiographic grounds was fundamental to pedological understanding, land use and agricultural development. It ran counter to the prevailing view in Europe and North America that climate was the main factor determining soil variation. Trapnell was a pedological pioneer who merits much greater credit than he has received from soil scientists. His profound appreciation of the relation between the vegetation, soil and African farming systems is a lesson for soil scientists today. They in turn will find a great deal in traditional knowledge that they can apply to solve current problems. I therefore welcome this paper by Namwanyi and his co-authors.

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