

Impact of Forest Landscape Restoration Practices on Soil Physical Properties Dynamics: the case of the Head of Mékrou Watershed in Benin

Abiolla Robertson Kévin Amoussou, Michel Kabirigi, Katharina Löhr, Christine A. I. N.Ouinsavi

Introduction

- Deforestation and forest loss have led to the degradation of soil health, compromising essential ecosystem.
- Studies have explored the potential benefits of Forest Landscape Restoration (FLR) practices for soil.
- It's crucial to recognise that the efficacy of these practices may vary across different contexts and environments, particularly through changes in soil physical properties.

Objectives

- Our primary objective is to evaluate the impact of land use through FLR practices on bulk density, organic matter content, and pH, key indicators of soil health within the Head of Mékrou Watershed (TBVM) in Benin.

Methods

- This poster presents part of a PhD research conducted in the Mékrou watershed, Benin.
- The study includes soil sampling for laboratories analysis at three depths (0–20 cm, 20–40 cm, and 40–60 cm) across restoration types within the watershed, namely agroforestry, fallow, and riparian restoration.

Results

- Organic matter content was highest under agroforestry systems, particularly in the 0–20 cm soil layer.
- Bulk density was generally higher in fallow areas compared to other restoration types, with no significant variation across soil depths.
- Concerning pH, it was not significant by restoration type but was significantly higher at 40–60 cm depth layer.

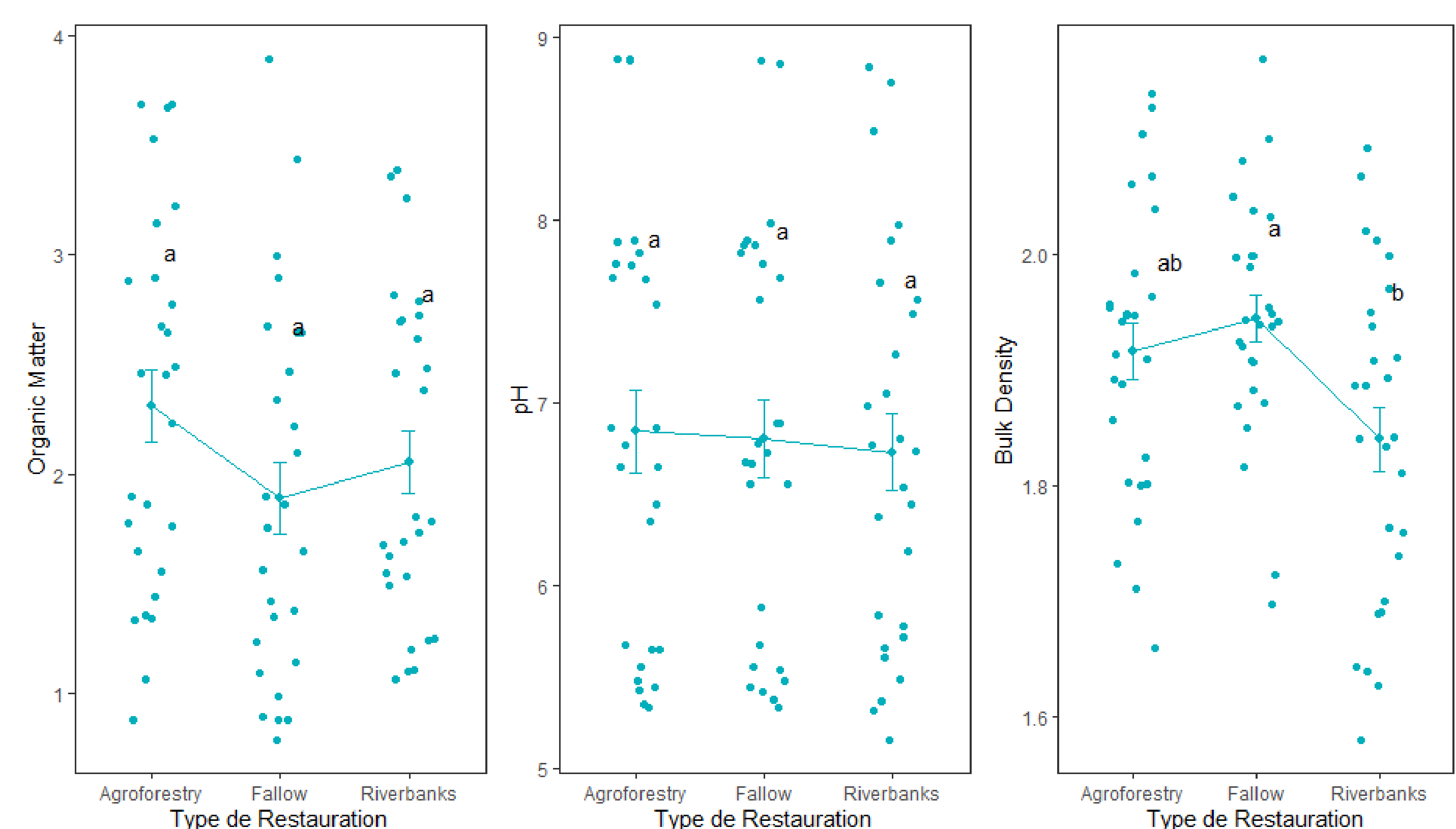


Figure 2: Soil properties by restoration type

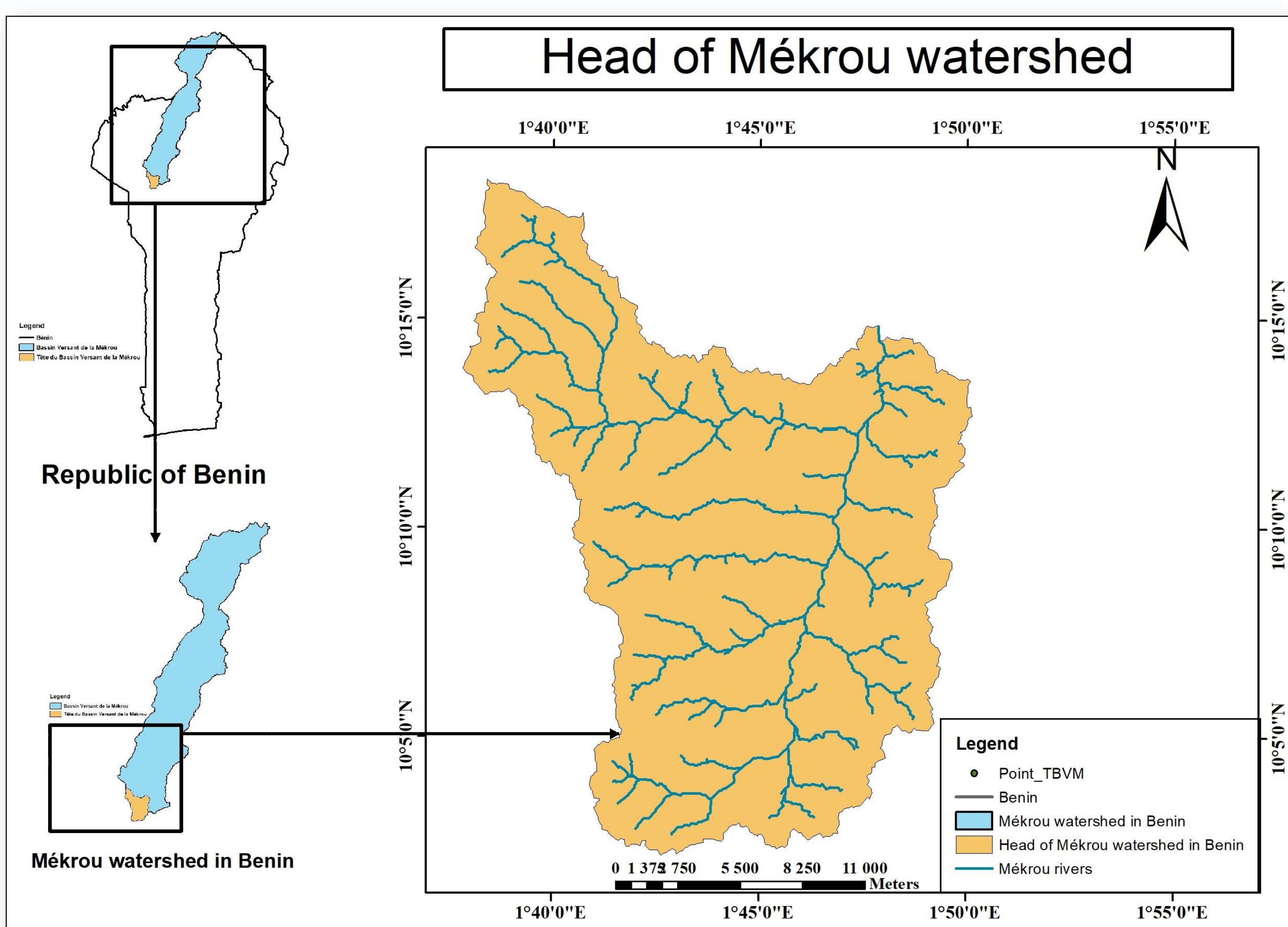


Figure 1: Map of the head of Mékrou watershed



Photo1: Sampling bulk density at the top layer in the head of Mékrou watershed

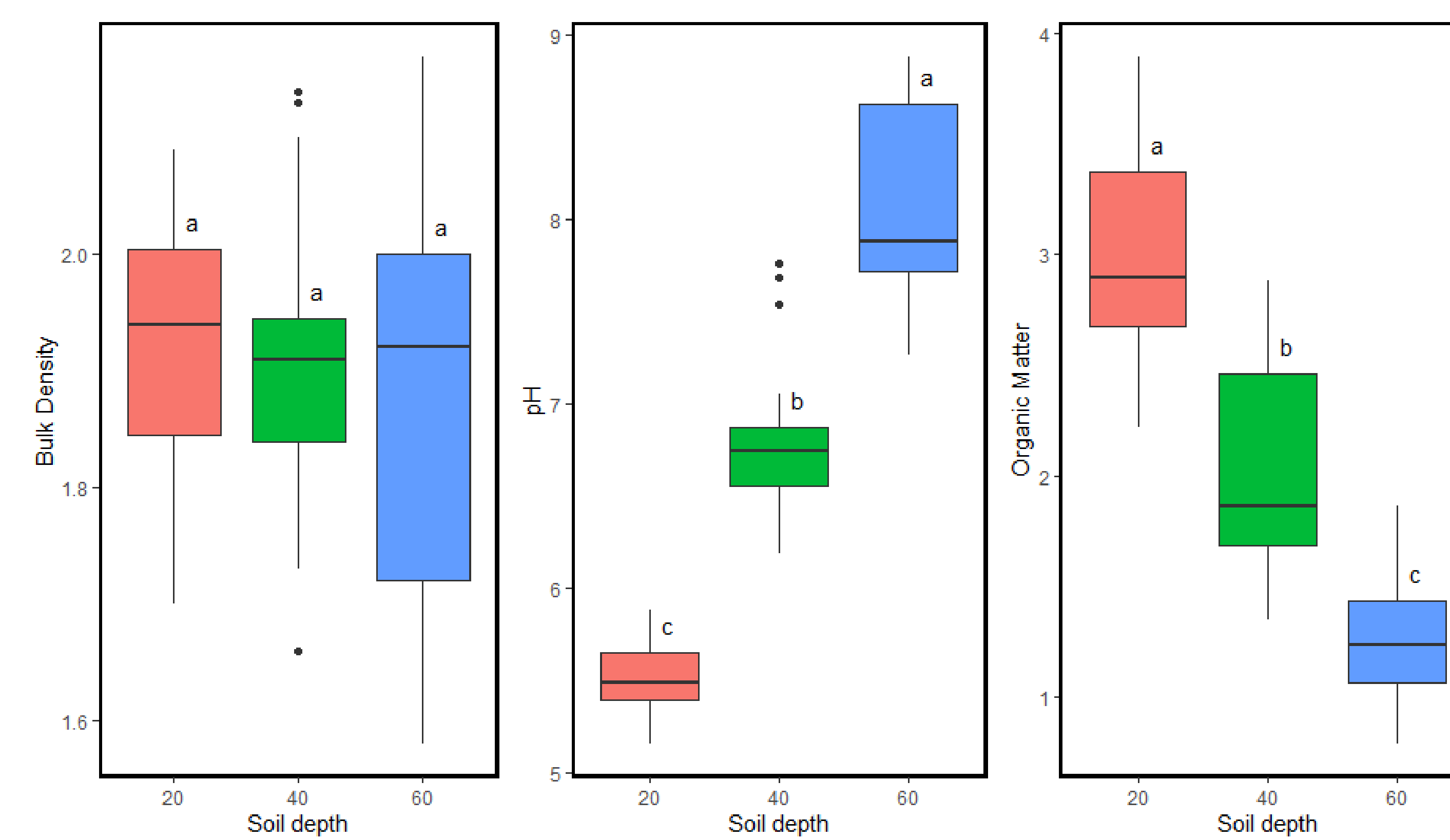


Figure 3: Soil properties by soil depth

Conclusion

- Forest Landscape Restoration practices have significant potential for enhancing soil health in watersheds like the head of Mekrou watershed.
- These variations may be influenced by interactions with other land uses, such as cropping systems.
- These findings provide valuable insights for policymakers and land managers, helping them prioritize restoration interventions based on the vulnerability of soils to human activities.