Description

This trial delineates terracing recommendation domains for Rwanda using a top-down spatial targeting approach. The methodology is informed by Muthoni et al. (2017) on spatial targeting of agricultural innovations and Hassall et al. (2023) on typology construction for agricultural systems. Terracing is a nationally important land management practice in Rwanda due to steep slopes, high rainfall intensity, and severe soil erosion risk. The analysis integrates spatial data on slope, rainfall, soil texture, population pressure, and accessibility to capture the key structural conditions influencing the relevance and feasibility of terracing interventions.

Delineation of Recommendation Domains

Recommendation domains were delineated for Rwanda, focusing specifically on terracing as a soil and water conservation innovation. Spatial variables were selected based on known biophysical and socio-economic drivers of terracing adoption in Rwanda. Slope and rainfall represent erosion pressure, soil texture captures erosion susceptibility, population density reflects land scarcity and intensification pressure, and travel time to cities proxies access to extension services. Principal Component Analysis (PCA) was used to summarize dominant gradients of variation, followed by hierarchical clustering to identify homogeneous terracing environments. A random forest model was used to map these domains spatially.

Scope of the Recommendation Domains

The resulting recommendation domains represent contexts in which terracing interventions are expected to face similar constraints and opportunities, rather than predictions of adoption or impact. The domains are appropriate for:

- Strategic targeting of terracing programs
- Differentiating implementation strategies
- Supporting planning and prioritization at the national scale

Summary Statement

In summary, this repository demonstrates how nationally available spatial data can be used to delineate terracing recommendation domains in Rwanda. By aligning variable selection with the physical drivers of erosion and land pressure, the analysis provides a transparent and reproducible framework for spatial targeting of soil conservation interventions, while acknowledging the need for complementary bottom-up evidence in future work.