



Identifying population profiles and estimating the likelihood of adopting vermicomposting using machine learning methods

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ABSTRACT

Objective: This study aims to identify the profiles of households that are most likely to adopt vermicomposting.

Methodology and Results: Through a survey of 278 households in the localities of Bama, Bobo-Dioulasso and Kotédougou in Burkina Faso, it highlights disparities in waste management and recovery according to the level of urbanisation. Sorting of waste is the most widespread practice, with 25 to 38 per cent of respondents, followed by composting waste, with 19 to 27 per cent. Vermicomposting is virtually non-existent, ranging from 0 to 4%. The Random Forest model with mtry = 7 achieves an accuracy of 77.45% and a kappa of 0.65. The change in composting practice is the most decisive variable with a Gini index of 18, followed by waste management at 13, and age and household size at 11. The decision tree revealed that 35% of households, with highly motivated and educated profiles, involved in various waste management practices, have the highest adoption probabilities, ranging from 0.62 to 0.75. Vermicomposting has an elitist adoption profile, almost exclusively associated with academics and civil servants, which explains its low uptake. The findings highlight the need to promote vermicomposting through awareness campaigns and practical training. Local authorities and extension services should prioritize motivated household profiles and provide them with the technical support and materials needed to get started. These measures could encourage wider adoption of vermicomposting and improve the recovery of household organic waste in Burkina Faso.

Keywords: vermicomposting, adoption, Random Forest, decision tree, waste.