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## Characterisation of shea tree and maize agroforestry parklands in northern Benin

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### Abstract

Maize (*Zea mays* L.) contributes significantly to food security and poverty reduction in northern Benin where it is traditionally grown within selectively thinned naturally regenerated shea trees (*Vitellaria paradoxa* C.F. Gaertn).

These shea-maize parklands promote a biodiverse land use. Recent policies aiming at the intensification of these systems have been largely unsuccessful. This is largely because they are heterogenous in their management, tree structure and composition. Hence this study aimed at classifying them into groups. To this end a survey was used to collect socioeconomic and farm management information from 70 randomly selected farmers in Boukoussera and Wewe. Additionally farm assessments was undertaken to obtain information on tree density and richness and maize grain yield. Principal component analysis and hierarchical clustering were used to define three distinctive groups. Although tree species richness of Group 3 parklands was 40 % higher than of parklands in group 1 and 2, this difference was not statistically significant. Average tree density of parklands in Groups 1 and 2 was 2.5-times lower ( $p < 0.01$ ) than average tree density of Group 3 parklands. Group 1 parklands benefitted from seven-fold higher ( $p < 0.01$ ) application of inorganic fertilisers than in Groups 2 and 3 parklands. As a result, average maize grain yield in Groups 2 and 3 parklands was 26 % lower than that of Group 1 parklands. The amount of herbicide used in Group 2 parklands was five-times greater than in Group 1 parklands. Our study strongly suggests that interventions to improve shea-maize parklands in northern Benin should be tailored to location specific characteristics.

**Keywords:** Farm management practices, shea maize parklands, shea tree density