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Cattle corralling strategies for soil management in northern Benin: Benefits, constraints, and determinants

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Abstract

Developing integrated systems to manage soil fertility in the context of climate change has become a priority for our generation. This study examined the benefits, constraints, and factors that determine the adoption of cattle corralling practices in maize-based farming systems. The study answers the following questions: (i) what socio-demographic factors determine the different cattle corralling types adoption in rural Northern Benin? and, (ii) how the benefits and constraints of cattle corralling practices are perceived among smallholder farmers? In this study, we employed surveys from 392 households of smallholder farmers across three agroecological zones of Northern Benin for data collection. The descriptive statistic, Factorial Analysis of Correspondence (FAC) followed by an Ascending Hierarchical Classification (AHC) was used to examine the cattle corralling typologies among the smallholder farmers. A binary logistic regression model was performed to investigate the drivers of adoption. The results show that cattle corralling is widely known (89 %) and adopted (71 %), but the factors viz. security (44 %), water availability (33 %), forage availability (27 %), and cattle ownership (50 %) are perceived as very constraining for cattle corralling practice. The FAC and AHC reveal three groups of cattle corralling practices across the study area: overnight-rotational continuous corralling (ORCC), discontinuous corralling (DC), and corralling contract (CC). The adoption of cattle corralling as soil fertility management practice depends mainly on the agroecological zone ($p < 0.001$), educational level ($p < 0.001$), ethnicity ($p < 0.001$), access to credit ($p < 0.001$), awareness of corralling ($p < 0.001$), access to extension services (< 0.001), distance fields-house ($p < 0.001$), breeding strategy ($p < 0.001$) and the production objective ($p < 0.001$). The paper contributes to an understanding of the different typologies of cattle corralling practices and highlights the various socioeconomic factors driving its adoption by smallholder farmers. This is crucial for the upscale cattle corralling practices in the face of climate change in Benin and West Africa.

Keywords: Crop-livestock integration, drivers, sustainable land management