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Role of Ecosystem Services of Termites in Agriculture in Pendjari Region (Benin)

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Abstract

Termites and termite mounds revealed to be of multipurpose use for African local communities: termites and mushrooms for human food and chicken feed, and mounds for soil fertilisation, fungus and health care plants' nutrition, traditional ceremonies and construction. The african termite *Macrotermes bellicosus* are particularly impressive. The species build remarkable mounds, which can reach an extent of up to 30 meters and a height of 7 meters. Recently, studies executed by BIOTA West Africa teams observed the decreasing of termite mounds in the populated area of Pendjari region, Benin. We present here the approach used to investigate the relationship between mound population and sorghum yield and the causalities of the mounds decreasing in the region.

The methodology used is based on descriptive statistic and regression using SPSS 16.0. According to the relationship between “sorghum yield” and “termite mound density”, a regression of the dependent variable “logarithm sorghum yield” gave a positive coefficient (0.168) for the explanatory variable “logarithm living termite mound” and confirms that the relationship between “sorghum yield” and the “density of living termite mound” respects the Cobb-Douglas function. The model is significant at 5% with Adj. R square equal to 20.9%.

According to the causalities of mound decreasing, a multiple regression of the dependent variable “living termite mound density” with its explanatory variables shows that the variable “cotton in crops' rotation” has a negative influence on “living termite mound density” (coefficient= -0.499). The model is significant at 0.1% (with Adj. R square equal to 20.6%).

Therefore, we define two categories of farming system: “the cotton based farming system” defined as the cropping system with cotton in the rotation during the last five years and “the no-cotton farming system” defined as the cropping system without cotton in the rotation during the last five years. Rice land without cotton hosted more living *M. bellicosus* termite mounds (90% of the total mounds or 1.8 living mounds per ha) than dead mounds (0.18). But in terms of number of mounds, the densities declined from cotton via beans, sorghum and maize to yams. Dead termite mounds had the highest percentage of mounds on beans (cotton system), sorghum (cotton system) and cotton crop land. This might suggest that mounds are destroyed during cotton farming.

Keywords: Benin, ecosystem services, Pendjari, termite

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