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Examine farmer's perceptions of integrating cattle rearing into the cashew-crop agroforestry system with emphasis on farmer's farming system and carbon sequestration in Benin, West Africa: Evidence from household survey using TAPE

Zinsou Bernus Djigbe[1], Rodrigue V. Cao Diogo[2], Pierre Gbenoukpo Tovihoudji[3]

[1] *University of Parakou, Fac. of Agronomy (UP/FA), Benin*
[2] *University of Parakou, Dept. of Sci. and Techn. of Animal Prod. and Fisheries, Benin*
[3] *University of Parakou, Dept. of Crop Production, Benin*

Abstract

The study focuses on promoting sustainable agricultural practices in cashew agroforestry systems in Benin's Tchaourou Sud-Borgou Zone. Integrated-crop-livestock-forestry (ICLF) systems are being promoted as a means of sustainable agricultural intensification. However, there is a lack of evidence regarding the resilience of cashew-based agroforestry systems, especially in cashew high-production regions where soil fertility loss is prevalent. To address this, the study selected 208 mixed farms in four villages in Tchaourou. The farms integrated cashew plantation intercropping and livestock into their production systems. The farms were assessed using the FAO-designed TAPE (Tools for Agro-ecology Performance Evaluation) tool to analyse their agro-ecological performance as well as to evaluate farm diversity.

The results showed that overall, the farms had low agro ecological performance, with only three out of ten dimensions meeting or exceeding the threshold of 50 %. The agroecological performance did not significantly differ between survey villages. The study identified three main classes of farm diversity: 22 farms in an incipient transition phase (10.57 %), 2 agroecological farms (0.96 %), and 184 non-agroecological farmers (88. 46 %). These findings highlight opportunities for agro-ecological transition within each identified cluster.

Furthermore, our research also aimed to examine the extent of carbon sequestration within ICLF systems, to accomplish this, we utilised carbon estimation methods proposed by the TAPE tool. Surprisingly, our findings indicated that ICLF farming systems exhibited a higher capacity for carbon sequestration compared to non-ICLF farming systems. It is worth noting that effectively managing this carbon sequestration through the consideration of ICLF spatial planning can yield significant economic value.

Keywords: Agro farmer, agroforestry, farming system, grazing cattle, ICLF

Contact Address: Zinsou Bernus Djigbe, University of Parakou, Fac. of Agronomy (UP/FA), 40 Ilot, Parakou, Benin, e-mail: djigbezinsou7@gmail.com