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## Contribution of Agro-Silvo-Pastoral System in the Livelihood of Rural Households in Central-West of Sudan

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### Abstract

Despite the proper role of agro-silvo-pastoral system (ASPS) in enhancing ecological services as well as soil conservation, the contribution of the system to the household income and livelihood in Sudan is still relatively limited. This study aims to determine the income generated by the best land use alternative mix of agro-silvo-pastoral system of the farm enterprises activities. It is focused on the profitability of trees mainly *Acacia senegal* and other non-timber forest products with comparative benefits of important crops and animals in the area. The data were derived from field survey that is carried out in 2014 in three localities in North Kordofan, namely Wad Banda, Elkhawei and En-Nuhud), central-west of Sudan. Structured questionnaires were distributed to 250 farm households. A cluster random sampling technique was used for the selection of sampling. Subsequently, focus group discussions with the key informants in the village communities were also conducted. Partial budget, benefit cost analysis were used to analyse the data. A sensitivity analysis was conducted to test the effects of some assumption concerning increase in tree product establishment costs and reduction in tree product prices. The results shown that within three zones animals' activities are dominated and acquired highly net revenue in comparison to other components of agro-silvo-pastoral system. Regarding the comparison between zones, the finding of the result reveals that ASPS is dominating in En-Nuhud Locality. The system recorded high net revenue in all the three zones under study. Wad Banda zone showed highest income in trees product, Elkhawei recorded higher net revenue in animals and En-Nuhud revealed that crops are the best. Following the application of sensitivity analysis the result shows relatively high net revenue under assumption (5%, 20% and 40%) increase and decrease of tree product costs that could be incentives for people to invest in such activities. Based on the findings, the study suggests that in order for the agro-silvo-pastoral system to be improved, government should help to formulate a supportive policy that enhance the land use alternative mixes of agro-silvo-pastoral system in the future.

**Keywords:** Agro-silvo-pastoral, household, livelihood, partial budget, profitability