AN EVALUATION OF SUITABLE TREES FOR ECOSYSTEM SERVICE DELIVERY

IN COFFEE-AGROFORESTRY IN CENTRAL UGANDA

BY

HANNINGTON BUKOMEKO

BACHELOR OF COMMUNITY FORESTRY (MaK)

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ABSTRACT

Coffee is an important cash crop in Uganda cultivated in a multifunctional agroforestry system that provides a variety of ecosystem services and disservices. Although trade-offs between services and disservices depend on selected tree functions, knowledge of tree suitability is scanty. This study (i) determined tree composition and diversity, (ii) determined functional suitability of trees based on local knowledge and (iii) compared tree diversity of different functional groups in different rainfall zones. Farmers ranked the ecosystem services in order of importance to their livelihoods and trees in order of suitability for various ecosystem functions. Based on local knowledge, trees were grouped according to suitability for providing different ecosystem services. Sampling was done from three rainfall zones of central Uganda; high (> 1300 mm), Moderate (< 1300 > 1100 mm) and, low (< 1100 > 900 mm) where agroforestry trees were inventoried and species richness compared across rainfall zones. Data analysis involved species accumulation curves to compare species richness among rainfall zones, 'BradleyTerry' approach to model ranked data of functional suitability. Re'nyi diversity profiles were used for comparing functional groups in different rainfall zones. Results show that species richness was generally low and differed among rainfall zones. Tree-species composition, relative suitability of trees to provide ecosystem services and relative importance of ecosystem services to farmers differed significantly among rainfall zones. Trees were grouped according to functional suitability in each rainfall zone. The most diverse functional groups differ from the most important functional groups to farmers. Farmers' therefore need to diversify agroforestry tree composition with respect to trees that serve farmers' priority ecosystem functions.