

## Abstract

Natural forests in Kenya are important national assets that play critical roles in the economy while offering a range of ecological services. The natural forests ecosystems have experienced massive degradation over the last three decades. The early assault on natural forests involved clearing thousands of hectares to create farms and room for establishment of exotic plantation species known for their superior growth performance and economic returns since 1920s. The recent prominence placed environmental conservation and provisioning of environmental service such as water and biodiversity has enhanced investment in rehabilitation of degraded natural forests since 1990s. The development of multiple uses of natural forests for production of timber and environmental services is one strategy that is being discussed by policy makers and forest users. However, the strategy is hindered by limited information on potential yields and economic gains from use of indigenous species in forest restoration activities. The study was aimed at bridging the knowledge gap by assessing the growth, yield potentials and financial returns of four indigenous species namely *P. africana*, *X.gilletti*, *J. procera*, and *P. fulva* was initiated in 2006. The study is important because of the increasing focus on biodiversity and forest conservation and their contribution to socioeconomic development in developing countries. The study involved collection of growth data from old plantation stands in Kakamega, Nandi and Mt Elgon and derivation of individual tree volumes and yields using volume equation tables developed by Wachiori et al (1996). The generated costs of establishing and maintaining plantations and prevailing stumpage prices were used in the financial cost-benefit analysis for study species. The study revealed a strong correlation between growth in yield per tree and age as the coefficient of determination of all the species was over 50%. The mean annual increment in volume were 10.09 m<sup>3</sup>/ha for *P. africana*, 9.57 m<sup>3</sup>/ha for *X. gilletti* 7.46 m<sup>3</sup>/ha *P. fulva*, and 3.73 m<sup>3</sup>/ha for *J. procera* that is relatively low as compared competing exotic species that ranged between 15 to 60 m<sup>3</sup>/ha/yr. The optimal financial rotation for *X. gilletti*, *P. fulva* and *J. procera* was 38 years while that for *P.africana* was 48 years. The study revealed that at an interest rate of ten percent the four species was found to be financially viable for use in forest restoration activities. However, the yields and returns are low as compared to competing exotic species. It is recommended that more experimental plots need to be established for collection of accurate data for better growth and yield assessments.