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Sustainability of Forest Product Use in Zimbabwe

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Abstract

Forests provide a wide variety of commodities which are used by rural dwellers in tropical countries and contribute to their welfare. During the 1990s Zimbabwe experienced an upsurge in the marketing of forest products, in particular woodcarvings. The potential social and ecological impacts on forests originating from this commerce are alarming. To quantify the impacts of the woodcarving sector on the forest and to identify sustainable extraction rates, a simple growth model was developed and tested. The model was used to analyse the development of growing stock, increment, and the annual allowable cut in a miombo woodland in southern Zimbabwe. Based on an inventory and on the assessment of growth rates, various extraction scenarios for two land tenure classes (communal and private) were modelled. The optimal growing stock (where the increment reaches its maximum) of the nine tree species which are preferred for carving is approximately $7.3 \text{ m}^3 \text{ ha}^{-1}$ and the highest potential increment at this point is about $0.11 \text{ m}^3 \text{ ha}^{-1} \text{ yr}^{-1}$ under a ‘current demand’ scenario. The consumption of carving wood in the study area is around 2 trees with a dbh $\geq 50 \text{ cm}$ per 100 ha and year (or $0.034 \text{ m}^3 \text{ ha}^{-1} \text{ yr}^{-1}$ of carveable wood). At present, considering the growing stock ($8.1 \text{ m}^3 \text{ ha}^{-1}$) and annual increment ($0.10 \text{ m}^3 \text{ ha}^{-1} \text{ yr}^{-1}$), sustainable harvesting is only feasible on land under private tenure. The growing stock ($2.7 \text{ m}^3 \text{ ha}^{-1}$) and annual increment ($0.01 \text{ m}^3 \text{ ha}^{-1} \text{ yr}^{-1}$) conditions on communal land do not allow sustainable harvests. Due to the degraded forest structure under this land tenure a decline of the species used for carving is likely to occur even if harvesting is abandoned immediately. Resource regeneration would be feasible if stands are artificially regenerated by e.g. enrichment planting. The model shows that two trees $\text{ha}^{-1} \text{ yr}^{-1}$ in-growth in the 15 cm diameter class on communal land would be sufficient to elevate the current (low) growing stock levels over the no-use scenario. Alternatively, if the current demand of wood is maintained and if two trees $\text{ha}^{-1} \text{ yr}^{-1}$ in-growth in the 15 cm diameter class are obtained, the current growing stock could be maintained.

Keywords: Forest products, growth and yield, woodcarvings, Zimbabwe