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Can native tree species plantations in Panama compete with Teak plantations? An economic estimation

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Abstract Panama has the highest rate of change in the area of primary forests within Central America. However, to meet growing timber demands, it became popular over the last decades to establish plantations made up of foreign species such as *Tectona grandis* or *Pinus* spp. In the majority of the cases the species used are well known; their characteristics such as growth performance have been reviewed intensively and can be accessed in numerous publications. Characteristics of Panama's native tree species of commercial relevance such as *Hieronyma alchorneoides*, *Swietenia macrophylla* and *Terminalia amazonia* are largely unknown and have been investigated within the study at hand. Using valuation methods of financial mathematics, the competitive position of these three indigenous species was assessed, the results compared to those of *T. grandis* stands in the same area. Land costs and taxes were not considered, as they would be the same for all species. Financial estimates for indigenous species will enlarge their acceptance for use in reforestation and plantation projects. Using the NPV method and applying the standard scenario, the profitability of *T. grandis* is lower than that of *T. amazonia* and *S. macrophylla* and lies only slightly above the profitability calculated for *H. alchorneoides*. This result clearly indicates that the investigated native tree species are comparable with *T. grandis* regarding their economic profitability. Besides its ecological impact, growing native tree species is now also economically legitimate. By calculating land expectation values for all tree species, ideal rotation lengths could be determined. For these species, considerable flexibility exists regarding the optimal rotation length.

Keywords Reforestation · Financial analysis · Land expectation value · Net present value · Growth · Yield · Profitability

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