

## SAPLING RESPONSE OF FOUR INDEGENOUS TREE SPECIES TO DIFFERENT LIGHT REGIMES IN A PINE STAND AT HANTANA

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Of the deforested and degraded lands in the humid regions of the island, mostly in close proximity to natural forests, about 18,000 ha of *Pinus caribaea* plantations have been established as buffer zone plantations by the Forest Department. Consequently, they are subjected to frequent fires set by local people who do not see much value in them for their subsistence. These plantations thus remain under-productive and under-utilized particularly due to the paucity of plants and economic diversity for rural development. Therefore, more imaginative, community-friendly and low-cost management interventions are required to restore plant and economic diversity in these biodiversity-poor monoculture plantations.

In this pilot project, we have attempted to enrich a 25-year old *P. caribaea* stand in the Peradeniya University campus with four indigenous tree species with proven economic value viz. Bedi del [*Artocarpus nobilis* Thw.], Mee [*Madhuca longifolia* (L.) Macbride], Gini sapu [*Michelia champaca* L.] and Bulu [*Terminalia bellirica* (Geartn.) Roxb.]. The experiment included planting of selected species under (i) full shade (FS) of the *P. caribaea* canopy (ii) partial shade (PS) created by the removal of three rows of *P. caribaea* trees, and (iii) in full-light (FL) in a adjoining grassland without *P. caribaea* trees.

A total of 2,659 saplings belonging to the four selected tree species were planted in the two treatments (PS and FS) and in the control (FL). The experimental area was split into two main blocks representing upper and lower slopes. Within each of these main blocks, a randomized complete block design with three replicates per treatment was constructed.

Over 90% of the existing overstorey vegetation of the selected site was represented by the planted *P. caribaea* trees while 50-85% of the understorey coverage was of the grass *Panicum maximum* Jacq. This suggests that over the 25 years of its existence, the natural enrichment of the *P. caribaea* stand by other broad-leaf indigenous species of any economic value has been minimal.

The incremental mean plant height and the root collar diameter over a period of two years showed much variability among species in the two treatments and control plots indicating the autecological distinctiveness of the species selected. Preliminary analysis of the results gathered so far from this on going study indicates that of the four species planted, *Michelia champaca* has performed better than the other three species under the partial shade created within the mono-specific *P. caribaea* stands. These four species hold promise as potential indigenous species capable of converting Pine stands into economically and ecologically more diverse, mixed species stands.