TOWARDS ECOLOGICAL AND ECONOMIC RESTORATION OF DEGRADED RAIN FOREST LANDS: A SRI LANKAN EXPERIENCE

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Abstract

Degradation and eventual denudation of biologically-rich lowland rain forests of Sri Lanka has resulted in fragmentation and drastic reduction of closed canopy natural forest cover to less than 9% of their original extent. These denuded forest areas have been invaded by fire-tolerant *Dicranopteris* fernlands which, in the recent past, were planted with Caribbean pine (*Pinus caribaea*) by the Forest Department of Sri Lanka. Over 18,000 ha of such monoculture plantations of *Pinus caribaea* interspersed among natural forests and human habitations have been sub-optimally managed due to limited availability of resources. Consequently, these plantations remain under-productive and under-utilized particularly due to paucity of plant and economic diversity for sustainable rural development.

We have examined the feasibility of using Caribbean pine as a nurse for establishing selected rain forest timber and non-timber species as a mixed species plantation trial in the buffer zone of Sinharaja World Heritage Site. We selected five species of trees and four non-timber species in experimental treatments that created micro-sites for planting seedlings within and adjacent to canopy openings of an 11 year-old pine plantation.

The results after twelve years revealed that planting within the centres of 8 m wide canopy openings provided conditions for greatest growth of tree species. Shade intolerant tree species showed greater response increases in height and diameter growth than the shade tolerant species. Results from these experiments could be used to construct planting guidelines and economic valuations for the various species tested for optimum species combinations for restoration of degraded rain-forests. These mixed-species forest stands also have the potential of acting as ‘gene bridges/corridors’ linking forest fragments thus alleviating genetic erosion of indigenous plant species of rural economic value.