Evaluation of Restoration Methods of Pine Plantation Adjacent to Natural Forest in Buffer Zone of Sinharaja World Heritage

Kumara K.H.S.P. and Pushpakumara D.K.N.G.*
Department of Crop Science,
Faculty of Agriculture, University of Peradeniya, Peradeniya, Sri Lanka

The Forest Department of Sri Lanka experimented six methods in 2015 to establish a feasible and sustainable aproach in converting Pinus (*Pinus caribaea*) plantations to natural vegetation at Kahagala Research Block in Kamburupitiya forest range of Sinharaja World Heritage. Evaluated treatments were undisturbed Pinus plantation with regeneration (T1), ring-barked of Pinus trees with old regeneration (T2), newly planted stand with *Dipterocarpus* spp. and mixture of indigenous species after clear felling of Pinus and other vegetation (T3), natural succession without any disturbances over 7 years (T4), natural succession and patches has cleared around regenerating plants annually over 7 years (T5), natural succession and patches has cleared around regenerating plants and low slashing annually (T6). Six treatments were assessed after seven years from establishment by stand density, basal area, diameter classes and height class distribution, species diversity, and cost estimation to implement the treatments. Means and standard errors of variables were estimated as descriptive statistics. Treatments with old regeneration and Pinus stands were always better than younger stands in terms of diversity, stand structure. In T3, the stands were replanted with *Dipterocarpus* species and indigenous species, which was a less-successful restoration method. The diversity and stand density was low in T2 which could be due to damages to other trees caused during the felling period of dead Pinus trees. In T1 and T4, competition was high because Pinus trees are available in T1 and there are no management practices in T4; hence competition is high in T4. Management in T6 and T5 methods, tree stand density, stand structure, biodiversity, and cost of treatments are better than the others. As of the data, it is recommended to accelerate natural regeneration by felling of Pinus trees without clear felling of entire area, or take pines timber with least damage to natural vegetation or leave Pinus for natural death.

Keywords: Pinus plantation, Regeneration, Restoration

*ngpkumara@agri.pdn.ac.lk