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"Development on the margin"

Structure and Regeneration of Degraded Forest in Tam Dao National Park, Vietnam

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Abstract

The lowland tropical forest in Tam Dao National Park was degraded by human activities such as selective logging, clear-cutting, shifting cultivation, and so on. It had lost its structure, function, species composition and turned into degraded forest. The degraded forest (latitude 21°28'31.3", longitude 105°35'24.3") in the study area has been protected since 1996 and rehabilitated by natural regeneration. A total of 125 species representing 90 genera and 47 families were found in this forest. The basal area of forest is approximately 15 $m^2\,ha^{-1}$, it is more than two times smaller than the basal area of the mature forest (38 $m^2\,ha^{-1}$). Species richness of mature trees with diameter at breast height (DBH) > 10 cm is with 88 species of average. Besides that, the present structure of forest has only 3 layers: top-layer, under-storey and regeneration. The pre-dominant layer with tree DBH > 50 cm has been destroyed. The top-layer with trees 15–20 m in height and greater than 40 cm in DBH (such as *Mesua ferrea*, *Choerospondias axillaries*, *Styrax tonkinensis*, and *Canarium tonkinense*) is very rare. In contrast, the under-storey has a high density of trees around 8–10 m. The regeneration layer includes shrubs, seedlings and saplings of trees. The seedling and sapling density is about 9,200 stems ha^{-1} and 8,300 stems ha^{-1}, respectively. In general view, the process of natural regeneration in the degraded forest is quite good but some species with an important value index are absent, for instance: *Choerospondias axillaries*, *Symplocos laurina*, *Engelhardta chrysolepsis*, and *Sapium discolour*. In brief, even though this forest has been well protected it still has a poor structure and a low biodiversity because of the strong human disturbances in the past. Moreover, some valuable species are not present at the regeneration layer. Therefore, further research is necessary to stimulate regeneration of highly valuable species.

Keywords: Degraded forest, forest structure, human disturbances, natural regeneration

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