

SOIL SEED BANKS IN DIFFERENT LAND COVER TYPES IN HANTANA, SRI LANKA: INDICATORS OF FOREST REGENERATION POTENTIAL

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Hantana Mountain Range (HMR) has undergone various anthropogenic disturbances over time, leading to a landscape mosaic of unrestored, partially restored, and fully restored ecosystems. In this study, the soil seed banks across six land cover types in the HMR were examined to assess their regeneration potential under different stages of natural regeneration. This included an open grassland (OG > 30 yr), a grassland where forest restoration was initiated recently (RF – 1 yr), a grassland where forest restoration was initiated 30 years ago (RF – 30 yr), a *Pinus* plantation (PS > 30 yr), a *Pinus* plantation enriched with broadleaved plant species (EP – 20 yr), and a naturally regenerated secondary forest (SF > 30 yr). Four 10 × 10 m² plots were established in each land cover type, and three randomly selected 1 × 1 m² quadrats from each plot were used for seed bank sampling. Wet and dry season samples were placed in trays inside a glasshouse and monitored for four months. The seedling densities of woody species did not differ significantly among these sites ($p_{\text{wet}} = 0.616$, $p_{\text{dry}} = 0.899$). The highest seedling densities of woody species were recorded in RF – 30 yr during both seasons (Wet = 165.2 seedlings m⁻², Dry = 89.3 seedlings m⁻²). A significant difference in seedling densities of non-woody species between sites was recorded during the wet season ($p_{\text{wet}} = 0.000$). PS > 30 yr recorded the highest seedling densities of non-woody species (Wet = 548.0 seedlings m⁻², Dry = 285.7 seedlings m⁻²). Except SF > 30 yr and RF – 30 yr, other sites recorded a significant difference between seedling densities of woody and non-woody species ($p_{\text{OG}>30 \text{ yr}} = 0.008$, $p_{\text{RF-1 yr}} = 0.034$, $p_{\text{PS}>30 \text{ yr}} = 0.000$, $p_{\text{EP-20 yr}} = 0.002$). The invasive species *Clidemia hirta* was present in all sites (Wet 0 – 83%, Dry 53 – 96%). These results indicate that different restoration strategies shape the composition and regeneration potential of seed banks over time, thus contributing differently to the natural regeneration process.

Keywords: Hantana, Forest restoration, Land cover types, Regeneration, Soil seed bank