

## Characterizing soil nutrient status and growth performance of planted dipterocarp and non-dipterocarp species on degraded forest land in Peninsular Malaysia

### ABSTRACT

This study aims to assess the soil nutrient status and growth performance of selected six dipterocarp species namely *Dryobalanops aromatica*, *Hopea nervosa*, *Neobalanocarpus heimii*, *Shorea parvifolia*, *S. assamica* and *S. leprosula* and three non-dipterocarp species of *Azadirachta excelsa*, *Cinnamomum iners* and *Intsia palembanica* were performed six years after planting on degraded forest land in Pasoh Forest Reserve, Negeri Sembilan, Peninsular Malaysia. This assessment consists of determining soil nutrient status based on physico-chemical properties both in rehabilitated and adjacent secondary forests along with measurement of diameter at breast height and height and survival rate. The results showed that rehabilitating degraded forest land with dipterocarp and non-dipterocarp species had improved both soil nutrient status and valuable timber stocks. The soils were acidic with low levels of organic matter and exchangeable bases associated with high level of Al saturation. The negative charges derived from the organic matter and clay minerals play an important role in retaining soil nutrients and probably influence the soil nutrient status. Principal component analysis revealed three most important PC scores which explained 73.8% of total variation. PC1 represents cation retention capacity and soil organic matter. PC2 infers soil acidity, while PC3 related to physical properties of the soils. In the case of growth performance, *A. excelsa* and *C. iners* showed significantly high mean annual increments in diameter and height and survival rate at six years after planting. Irrespective of different ages after planting, the growth performance and survival rate of planted dipterocarp species especially *S. leprosula* and *S. parvifolia* were comparable to similar species grown at other planting trials in Malaysia.

**Keyword:** Degraded forest land, Dipterocarp, Growth performance, Rehabilitation, Soil fertility