

# GROWTH PERFORMANCE OF PLANTED *SHOREA MACROPHYLLA* UNDER LINE PLANTING TECHNIQUE

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## Abstract

A study on the growth performance and survival rate of planted *Shorea macrophylla* of different age stands was conducted at Sampadi Forest Reserve, Sarawak. The objectives of this study were to assess the growth performance and survival rate of planted *S. macrophylla* under reforestation activities that were implemented by Forest Department, Sarawak along with several agencies of Japan as to obtain preliminary data for further improvement of future reforestation activities in Sarawak. In this study, *S. macrophylla* planted under line planting method was selected. Study plots were established in the reforestation areas (planted with *S. macrophylla* in the year 1996; SM96, 1997; SM97, 1998; SM98 and 1999; SM99). Diameter at breast height (DBH), total height and survival rate were measured. The findings indicated that the growth performance in terms of survivability and mean annual increment of diameter (MAID) in SM96 were the highest and showed better growth as compared to SM97, SM98 and SM99. On the other hand, the mean annual increment of height (MAIH) in SM97 revealed the greatest height among other plots. The survival rate of *S. macrophylla* in SM96, SM97, SM98 and SM99 were 89%, 81%, 77% and 51% respectively. Substantial growth performance and high survival rate of *S. macrophylla* implied that microclimate condition such as competition between planted and existing pioneer species of the study area may have affected the planted *S. macrophylla*. Notwithstanding, it is recommended that proper silvicultural technique is crucial to manage the existing pioneer tree species towards the success of this reforestation programme.

Keywords: reforestation, *Shorea macrophylla*, growth performance

## 1 INTRODUCTION

Tropical rainforests are recognized as the richest ecosystems in the world in terms of structure and species diversity (Whitmore, 1998). On a large regional and global scale, tropical rainforests have an outstanding role and major influence in ameliorating and maintaining global climate change by reducing the accumulation of greenhouse gases (Shukla *et al.*, 1990). Though occupying only 7 % of the earth's land surface, over half of the planet's life forms are found in tropical rainforests (Whitmore, 1998). Tropical rainforests not only sustain biodiversity but provide homes to indigenous peoples, pharmacopeias of natural products, and provide crucial ecosystem services, such as flood amelioration and soil conservation.

Nonetheless, despite the multi-functional roles and richness, tropical rainforests are fragile habitats and are being destroyed rapidly. Conversion of forested areas to non-forest lands such as to pasture and agriculture have resulted in the permanent reduction of indigenous species including timber species such as *Dipterocarp* spp. from Dipterocarpaceae family (Montagnini *et al.*, 1997). Commercial logging activities, shifting cultivation, urbanization industry, natural disturbances like landslide and other forms of encroachment are all principal causes of deforestation in tropical regions (Geist and Lambin, 2002; ITTO, 2002). Due to the consequence of deforestation, excessive forest harvesting and shifting cultivation, tropical lands become rapidly eroded and infertile, and degraded farmlands are commonly abandoned.

Reforestation plays a vital role in maintaining our tropical rainforests and may offer one means of mitigating these processes of degradation while sustaining resident human communities. The importance of reforestation in the tropics includes productions of timber and other goods and services