



## STUDY ON REGENERATION OF TREE SPECIES IN TFRI CAMPUS PLANTATIONS, JABALPUR, MADHYA PRADESH

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**ABSTRACT:** The present study investigates the status of regeneration of different (planted and native) tree species of Tropical Forest Research Institute (TFRI) campus. Vegetation present in the campus represents a unique mix of native and non-native plants, which are coexisting and regenerating. Plantations were undertaken in 109ha of the campus area in form of experimental trials, avenue plantation, *ex-situ* conservation, progeny trials, provenance trials, etc. A total of 98 tree species were recorded from the campus area, of which 18 species showed regeneration and establishment. Both native and planted species are successfully regenerating in the campus. The most successfully regenerating species in the campus is *Leucanea leucocephala*. The other non-native planted species showing successful regeneration is *Santalum album*. The plantations also support regeneration of native species like *Butea monosperma*, *Acacia catechu*, *Diospyros melanoxylon*, *Anogeissus pendula*, *Mallotus philippinensis*, *Grewia asiatica*, *Buchanania lanzan* and *Bombax ceiba*. *Leucanea leucopholea* is an invasive species and needed to be removed in a phased mannered, however the species acts as nurse plant for *Santalum album*, which is a partial root parasite.

**Keywords:** *Plantation, regeneration, exotic, Leucanea leucopholea, Santalum album*

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Tree plantation is an effective tool for restoration of biodiversity and rehabilitation of degraded forest (Fang and Peng, 1997; Haggar et al., 1997; Loumeto and Huttel, 1997; Oberhauser, 1997; Zhuang, 1997). Plantations act as catalyst in forest succession by improving soil structure, nutrient cycling in the habitat (Lugo, 1997) and by providing microhabitats favoring growth and establishment of the species which otherwise cannot grow under open canopy, apart from this plantation also prevent soil erosion (Lugo, 1997; Parrotta et al., 1997; Cusak and Montagnini, 2004). Several studies have examined the understory diversity and nutrient accumulation patterns in the plantations of indigenous species (Haggar et al., 1997; Keenan et al., 1997; Stanley and Montagnini, 1999) and found these patterns to be influenced by the age, life-history traits of the planted species. Nature of tree species planted in plantation plays an important role in changing the micro-climate and soil properties which in turn may affect the species aggregation under plantation (Pande et al., 2002; Verma, 2000). Eucalyptus plantations have adverse effects on the undergrowth (Bhaskar and Dasappa, 1986), similarly Teak plantation has frequent canopy, which does not allow the adequate sunlight to reach to the ground, thus hampering the establishment and

growth light demanding species (Bhaskar and Dasappa, 1986; Thapliyal, et al., 2002). Plantations are likely to increase alpha diversity over time (Mizrahi et al. 1997), although a closing canopy will reduce the ground flora. Plantations of introduced species does not meet forage requirement of the native fauna (Sargent, 2009). Animals move into plantations, particularly for refuge and nesting habitat. However, plantations when carried out in degraded land support more biodiversity than open area. Species accumulation in the plantations and open area are often very different (Verma, 2000; Thapliyal, et al., 2002). Powersa et al., (1997) showed that some plantation species can enhance the development of more species rich understory vegetation. Apart from species aggregation plantations also determine other phyto-diversity characters in the community. Density of the ground plants per unit area is often found to be highest than in open area (Barman et al., 1997; Thapliyal et al., 2002; Dassappa, 1986). If tree plantations are to be used to catalyze successional processes,

A number of recent studies have highlighted the role that tree plantations can play in assisting recovery from prolonged anthropogenic disturbances (Lugo, 1992; Lugo et al., 1993; Parrotta, 1993, 1995; da Silva Junior et al., 1995). Fisher (1995) showed that there was a significant decrease in soil bulk density and increase in base cation, Soil Organic Carbon and