



INFLUENCE OF CANOPY GAP ON REGENERATION OF SAL
(*SHOREA ROBUSTA*) IN BORER AFFECTED AREA OF DINDORI
FOREST DIVISION, MADHYA PRADESH

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ABSTRACT: The present study describes the status of *Shorea robusta* regeneration in the forests, which faced outbreak of sal-borer epidemic during 1996-2000. Remedial felling was carried out in the compartments to remove the infested trees. Compartments for the current study were selected based on intensity of felling, moderate, heavy, very heavy and control. It was found that density of sal seedlings was high (>11000 seedlings/ha) in all the compartments, indicating sufficient number of adult trees in the community. Pole crop of *Shorea robusta* was recorded only in moderately felled compartment. The density of pole crop ranges between 33-333 stems per hectare, the low density of pole crop in the studied communities may be due to the biotic factors and grazing. Establishment of seedlings is dependent on locality factors and canopy opening. Canopy gaps resulting from the heavy and very felling are occupied by *Lagerstroemia parviflora*, *Diospyros melanoxylon* and *Anogeissus latifolia* in high densities, which compete with sal for the open space in the canopy. The sal-borer infestation has long lasting impact on regeneration in the *Shorea robusta* forest. Moderate infestation may alter the growth rate of the population, but heavy infestation may lead to change in community structure and composition.

Keywords: *Canopy gaps, impact, pole crop, remedial felling, sal heartwood borer*

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Sal is as an important tree species with high timber value (Tewari, 1995). Globally, the natural range of sal forests lies between 20–32°N lat. and 75–95°E long., where the distribution is primarily controlled by climate and edaphic factors (Gautama and Devoe 2006). Sal forests occupying an area of 105,790 km² in India are very important from both ecological and economical points of view as they not only harbor maximum biodiversity but are also a source of livelihood for millions of people. Unfortunately, Sal has been the victim of heartwood borer, *Hoplocerambyx spinicornis*. Ever since it was noticed as a pest on sal in 1899, its 20 epidemic outbreaks have been recorded in India causing extensive damage to *Shorea robusta* forests, which is compounded by the borer attacks. During the latest epidemic (1996-2001), the borer affected more than 3.5 million *Shorea robusta* trees in an area of around 5000 km². Although intensive studies were carried out on this pest, there is no control measure devised so far. The latest epidemic had to be confronted

with the previously known silvicultural and mechanical measures only. Out of 3.5 million infested trees, 1.59 million trees had to be felled and removed from the worst affected Dindori and Mandla Forest Divisions alone.

The selective felling of infested trees creates canopy gaps. Through time these gaps are filled with other trees, this replacement phenomenon or gap dynamics have been widely studied (Barton et al. 1989) and is considered to influence plant community dynamics (Xi et al. 2008). Regeneration processes in gaps depend on a range of biological factors, such as the life history, physiology and behavior of regenerating species the intensity of the growth of advanced regeneration of pre-disturbance origin and the colonizing ability of species (Arriaga 2000). However, regeneration also heavily depends on physical gap characteristics.

Many authors have proposed gap size to be the most important gap characteristic affecting the recruitment and establishment of various tree species