

GAP REPLANTING - AN EMERGING TREND IN REJUVENATION OF JUNGLE RUBBER AGROFORESTS IN JAMBI, INDONESIA

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As an intermediate system between natural forests and man made plantations, jungle rubber (*Hevea brasiliensis*) agroforestry is a predominant land use system in Sumatra and Kalimantan in Indonesia. Within a century after the introduction of rubber into Indonesia, nearly all food-crop based shifting cultivation has now been replaced by rubber-based agroforestry in the lowland peneplain zone of Sumatra. Lessons learnt from this development of rubber agroforests are of much interest for other regions of the world where food-crop based slash and burn agriculture has become unsustainable. In addition to providing cash income for the farmer, jungle rubber agroforests, with a high biodiversity value, also provide a range of non-rubber products and environmental benefits.

As an alternative to the rotational agroforestry involving slash and burn at the beginning of each cycle, gap replanting (locally known as *sisipan*) is emerging as an important, farmer identified method of gradually replacing senescing rubber trees with new plants. The approach is more like de-intensification of the jungle rubber system and leads to a more varied age structure of trees in a 'permanent' rubber agroforestry.

A study is reported here that aimed to identify factors that influence farmers' choice between intensive slash and burn and replant at field scale or less intensive *sisipan* (interplant) at patch scale in old jungle rubber agroforest. Individual farmer interviews were followed by group discussions in five villages in Jambi province. The identified factors included capital investment for starting a new cycle, labour constraints, land scarcity, risk from vertebrate pests, and production status. Monetary costs and gains coupled with perceived risks, seem to be the primary driving factors although non-economic factors cannot be neglected. Farmers' perception, technological developments, socio-political determinants are likely play important roles in choice between intensive and less intensive systems. However, adoption and sustainability of the gap replanting method of rejuvenating jungle rubber agroforests, and its potential as an alternative to slash and burn approach, will very much depend on its tangible economic returns. The paper also includes a brief economic comparison between various rubber production systems and results of a species richness study carried out in Jambi.