



LAC CULTIVATION FOR LIVELIHOOD GENERATION AND BIODIVERSITY CONSERVATION

A SLEM BEST PRACTICE

Indian Council of Forestry Research and Education has documented Lac Cultivation for Livelihood Generation and Biodiversity Conservation as one of the best practices for sustainable land and ecosystem management (SLEM) under the World Bank funded SLEM Project.

Lac cultivation is the subsidiary source of income for rural and forest dwellers. India has vast resource potential to produce lac. Major lac producing states in India are Jharkhand, Chhattisgarh, Madhya Pradesh, West Bengal, Odisha, Andhra Pradesh, Maharashtra and Uttar Pradesh.

Lack of skills and adequate knowledge have however hindered the vast potential for lac production that exists in the country. In the existing lac cultivation areas, there is further scope to enhance productivity by adoption of scientific lac cultivation technologies. The natural products derived from lac i.e. resin, dye and wax, have various applications in industrial sectors such as food products, cosmetics, pharmaceuticals, textile, adhesive, varnish, paints etc. Hence, adoption of improved method of lac cultivation is not only very easy in view of meagre requirement of labour, time and money but it also generates source of livelihood and high income in comparison to other agricultural crops.

Lac is a natural resin secreted by the tiny lac insects, mainly *Kerria lacca* (Kerr), for protection of mother insect as well as its young ones. The insects are cultured on tender shoots of hosts. It derives its nutrition by sucking the saps from the host plants. There are two strains of lac insect namely *Rangeeni* and *Kusmi*. Each of these strains completes its life cycle twice in a year, thus producing two crops in a year.



Strains of Lac Insect and their Life Period

| Strain/ Biotype | Crop | Season | Period | | Approx. Duration (months) |
|--------------------|----------|--------|------------------------|-----------------------|---------------------------------|
| | | | Raised (Inoculated) | Mature (Harvested) | |
| <i>Rangeeni</i> | Katki | Rainy | June/ July | October/ November | 4 |
| | Baisakhi | Summer | October/ November | June/ July | 8 |
| <i>Kusmi</i> | Aghani | Winter | June/ July | January/ February | 6 |
| | Jethwi | Summer | January/ February | June/ July | 6 |

Host Plants and their Suitability

Hot sub-humid areas are suitable for the cultivation of lac provided the area has specific host plants for planting the brood lac in the season.

| Host Plants | Common Name | Strain | Suitable Crop |
|---------------------------|-------------|-----------------|-------------------|
| <i>Acacia catechu</i> | Khair | <i>Kusmi</i> | Winter |
| <i>Butea monosperma</i> | Palas | <i>Rangeeni</i> | Summer and Rainy |
| <i>Ficus religiosa</i> | Pipal | <i>Rangeeni</i> | Summer |
| <i>Schleichera oleosa</i> | Kusum | <i>Kusmi</i> | Summer and Winter |





Lac Cultivation Operations

1. Pruning of host plants

- ▶▶ To ensure availability of good, healthy and succulent (tender) shoots
- ▶▶ To ensure availability of large number of shoots (area for lac culture)
- ▶▶ To provide new sprouts for maintaining its potential
- ▶▶ To remove dead, diseased and broken branches

2. Inoculation (infestation of lac hosts)

- ▶▶ To raise new crop of lac

3. Removing of used up broodlac sticks

- ▶▶ To prevent access of the insect predators and parasites of lac insects to new lac crop
- ▶▶ To avoid wastage of lac after drying up of brood lac (*phunki*) and prevent its falling on the ground

4. Pest Management and Spray of Pesticides

- ▶▶ To control the pests and diseases from affecting the lac crop

5. Harvesting

- ▶▶ The host plant gets the opportunity to rest and rejuvenate itself
- ▶▶ Ensures self-sufficiency in broodlac production
- ▶▶ Gives more succulent shoots
- ▶▶ Ensures regular income
- ▶▶ Provides sustained and higher yield, and
- ▶▶ Minimises incidence of predators and parasites

6. Scraping of lac from twigs

Methodology for upscaling: The site selected for upscaling must have sufficient host trees. Host tree seedlings/ saplings can be planted at suitable sites. The brood lac is implanted on fresh coppice shoot during July and October. The lac resin is produced and spread within seven days of emergence of insect. Lac cultivation areas in the country are using only 20-25% of the total available lac host trees whereas vast areas are left unexploited.

The brood lac cannot be stored for over a week and have low multiplication rate of production. The other factors are low minimum support price, availability of host plant or additional plantation, low value addition etc. Infrastructure to develop field repository/ germplasm bank of lac insect and host plant are some of the challenges for lac cultivation.

A proper training of stakeholders (beneficiaries/ farmers/ cultivators) in nursery raising, handling and transplanting of seedlings, water management, weed control in nursery and plantation as well as pruning of host plants, inoculation of brood lac insects, control measures and harvesting etc. is necessary for proper adoption of this SLEM best practice.

Indian Council of Forestry Research and Education (ICFRE), Dehradun as Ecosystem Services Improvement Project Implementing Unit (ESIP-PIU) is building the capacity of the local communities of ESIP project areas of Chhattisgarh and Madhya Pradesh for upscaling of Lac Cultivation for Livelihood Generation and Biodiversity Conservation: A SLEM Best Practice.

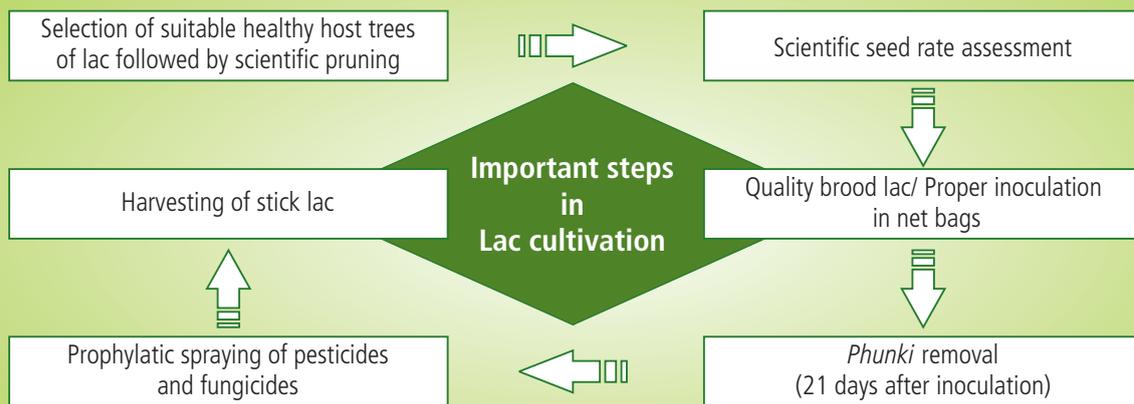
Benefits of Lac Cultivation

- ▶▶ Sustainable livelihood of the communities living in the forest fringe areas
- ▶▶ Promoting the community driven sustainable land and ecosystem management
- ▶▶ Conservation of biodiversity

Economics of Lac Cultivation

Lac is a high remunerative crop with a high potential income generation. The net return of lac grower with about 15 host trees comes to about Rs. 15000/- annually.





Details of contact source for more information

1. Tropical Forest Research Institute, Jabalpur (Madhya Pradesh)
2. Institute of Forest Productivity, Ranchi (Jharkhand)
3. Indian Institute of Natural Resins & Gums, Ranchi (Jharkhand)
4. Chhattisgarh State Minor Forest Produce (Trading & Development) Co-operative Federation Ltd., Raipur (Chhattisgarh)
5. M.P. State Minor Forest Produce Federation, Bhopal (Madhya Pradesh)
6. Chhattisgarh State Forest Department
7. Madhya Pradesh State Forest Department

Brief About ESIP

The World Bank funded Ecosystem Services Improvement Project (ESIP) supports the goals of the Green India Mission by demonstrating models for adaptation-based mitigation through sustainable land and ecosystem management and livelihood benefits. ESIP will introduce new tools and technologies for better management of natural resources, including biodiversity and carbon stocks. Main components of the project are: strengthening capacity of government institutions in forestry and land management programs, improving forest quality, and scaling up of sustainable land and ecosystem management (SLEM) best practices. ESIP is being implemented in the states of Madhya Pradesh and Chhattisgarh by Indian Council of Forestry Research and Education, Chhattisgarh State Forest Department and Madhya Pradesh State Forest Department under the overall direction of Ministry of Environment, Forest and Climate Change, Government of India.

Brief About ICFRE

Indian Council of Forestry Research and Education (ICFRE) is an autonomous body of the Ministry of Environment, Forest and Climate Change, Government of India. It is an apex body in the national forestry research system that promotes and undertakes need based research, education and extension in the forestry sector. It has a pan India presence with its 9 research institutes (Arid Forest Research Institute, Jodhpur; Forest Research Institute, Dehradun; Himalayan Forest Research Institute, Shimla; Institute of Forest Biodiversity, Hyderabad; Institute of Forest Productivity, Ranchi; Institute of Forest Genetics and Tree Breeding, Coimbatore; Institute of Wood Science and Technology, Bengaluru; Rain Forest Research Institute, Jorhat and Tropical Forest Research Institute, Jabalpur) and 5 centers located at Agartala, Aizawl, Prayagraj, Chhindwara and Visakhapatnam. Each institute are directs and manages research, extension and education in forestry sector in the states under their jurisdiction.

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