International Journal of Agricultural Sciences
Volume **10** | Issue 1| January, 2014 | 255-259

***RESEARCH PAPER***

# A study on impact of the *Lac* developmental programmes on *Lac* economy in Chhattisgarh

GOVIND PAL
Directorate of Seed Research (I.C.A.R.), Kushmaur, MAU (U.P.) INDIA
(Email : drpal_1975@scientist.com)

**Abstract :** *Lac* is a natural resin secreted by an insect known as *Kerria lacca* (Kerr.) which thrives on the tender twigs of specific host trees *viz.*, *palas* (*Butea monosperma*), *ber* (*Zizyphus mauritiana*), *kusum* (*Schleichera oleosa*), *Ficus* sp. *Lac*, yields three economically and industrially important components *i.e.* resin, wax and dye. The study pertains to the data collected from randomly selected 400 *Lac* growers (benefited and non-benefited) in four districts of Chhattisgarh during the year 2008-09. The results indicated that the percentage of host utilization had increased in case of benefited *Lac* growers in comparison to non-benefited *Lac* growers. Host utilization percentage of benefited *Lac* growers was 62.1, 36.2 and 44.5 for *palas*, *ber* and *kusum*, respectively. A shift has been observed in case of benefited *Lac* growers from lower production group to higher production group in both sticklac and broodlac (seed) production. The share of *Lac* income in total income has increased in case of benefited *Lac* growers from 17.0 to 25.2 per cent. About 86.0, 60.0 and 63.0 per cent more employment generation and 185.0, 348.0 (*ber-rangeeni*) 133.0 (*ber-kusmi*) and 118.0 per cent increase in net return have been found in *Lac* cultivation on *palas*, *ber* and *kusum*, respectively, for benefited *Lac* growers over non-benefited *Lac* growers. Higher level of broodlac production resulted in self sufficiency in broodlac and more utilization of host trees for *Lac* cultivation. Higher BC ratio and reduction in cost of production of broodlac and sticklac was found in case of benefited *Lac* growers in comparison to non-benefited *Lac* growers for *Lac* cultivation on all three hosts. This implies that there is need for strengthening and widening the extension activity and developmental programmes on *Lac* production and marketing so that majority of *Lac* growers can be empowered with scientific knowledge on *Lac* cultivation for increasing their income and employment.

**Key Words :** *Lac*, Impact, Developmental programme, *Lac* economy

**View Point Article :** Pal, Govind (2014). Impact of the *Lac* developmental programmes on *Lac* economy–A study in Chhattisgarh. *Internat. J. agric. Sci.*, **10** (1): 255-259.

**Article History : Received :** 24.04.2013**; Revised :** 17.10.2013**; Accepted :** 16.11.2013

## INTRODUCTION

*Lac* is a natural resin secreted by an insect known as *Kerria lacca* (Kerr.) which thrives on the tender twigs of specific host trees. The most common host trees for commercial *Lac* cultivation are *Butea monosperma* (*palas*), *Zizyphus mauritiana* (*ber*) and *Schleichera oleosa* (*kusum*), besides several other trees of regional importance (Roonwal *et al*., 1958; Varshney and Teotia, 1967; Sharma *et al.*, 1997). *Rangeeni* and *Kusmi* are the two strains of *Lac* insect which are based on preference of the insect for specific host plants and contributed significantly in the national *Lac* production. *Rangeeni* strain produces two crops in a year known as *katki* (crop harvesting in October) and *baisakhi* (crop harvesting in April - May), while *Kusmi* strain also produces two crops in a year known as *aghani* (crop harvesting in December - February) and *Jethwi* (crop harvesting in July-August). Lac cultivation is widely practiced in the states of Jharkhand, West Bengal, Chhattisgarh, Madhya Pradesh, Odisha, Maharashtra and parts of Uttar Pradesh, Andhra Pradesh, Gujarat and NEH region. It forms an additional earning support to the tribals of these regions. The country's production of *Lac* was 17,900 tons during 2010-11 (Pal *et al*., 2012).

Chhattisgarh state is promoting *Lac* cultivation and processing through various projects in large scale. Accordingly various kinds of developmental activities related to *Lac* were undertaken under these projects to increase *Lac* production impacting Chhattisgarh state to emerge as important *Lac* producing states of the country. Training on 'scientific method of *Lac* cultivation' and supply of other

improved inputs to *Lac* growers increases the quantum of their knowledge improved practices on *Lac* cultivation to improve productivity of *Lac* and stability in their income generation. Meagre information is available on impact of developmental activities related to promotion of *Lac* in Chhattisgarh. Keeping in view the above facts, it was felt essential to find out the impact of *Lac* developmental programmes in terms of host utilization, average *Lac* production, economics of *Lac* cultivation, livelihood condition, and generation of income and employment.

## MATERIAL AND METHODS

The present paper is based on primary data. For collection of primary data, four major *Lac* growing districts of Chhattisgarh were selected during the year 2008-09 for conducting the study. A total number of 400 *Lac* growers (non-benefited and benefited *Lac* growers) were selected and surveyed. Three stage stratified random sampling technique was adopted for selection of blocks, villages and farmers. Two blocks from each district and five villages from each selected block were identified. Then, ten *Lac* growers from each selected village (five non-benefited and five benefited *Lac* growers of developmental project on *Lac*) were selected / identified randomly. Thus the total number of *Lac* growers was 400. Primary data were collected from the respondents using well structured and pre-tested interview schedule. Tabular analysis was used to compare the different values of farm economy and other aspects of farm business.

## RESULTS AND DISCUSSION

The *Lac* host trees namely *palas* (*Butea monosperma*), *ber* (*Zizyphus mauritiana*) and *kusum* (*Schleichera oleosa*) are commercially exploited for *Lac* cultivation. The data in Table 1 indicate host utilization percentage of benefited and non-benefited *Lac* growers. It is evident from the table that the host utilization percentage of benefited *Lac* growers was 62.1, 36.2, 44.5 and 43.0 for *palas*, *ber*, *kusum* and other host, respectively. Host utilization percentage has increased in case of benefited *Lac* growers for all type of *Lac* hosts.

**Table 1 : Host utilization percentage of benefited and non-benefited lac growers**

| Type of growers | *Palas* | *Ber* | *Kusum* | Other host |
|---|---|---|---|---|
| Non-benefited growers | 23.4 | 27.1 | 31.0 | 0.0 |
| Benefited growers | 62.1 | 36.2 | 44.5 | 43.0 |

The main causes of low level of host utilization was shortage of funds for purchase of broodlac (seed), high cost of broodlac, distance of host plant from residence, difficulty in cultivation operation due to height and theft of *Lac*.

The data pertaining to scale of *Lac* production have been given in Table 2. The production of both sticklac and broodlac has increased on benefited *Lac* growers in comparison to non-benefited *Lac* growers. About 51.0 per cent benefited *Lac* growers produced sticklac in the production group below 100 kg. with average annual production 69.0 kg.; 24.0 per cent in the production group 100-200 kg. with average annual production 155.0 kg. and 25.0 per cent in the production group more than 200 kg. with average annual production 320.0 kg. About 46.0 per cent benefited *Lac* growers produced broodlac in the production group below 100 kg. with average annual production 34.2 kg.; 29.0 per cent in the production group 100-200 kg. with average annual production 86.0 kg. and 25.0 per cent in the production group more than 200 kg. with average annual production 196.0 kg.

The data in Table 3 indicate source of farm and off-farm income of benefited and non-benefited *Lac* growers. It is evident from the table that the share of farm income in total income of *Lac* growers has increased in case of benefited *Lac* growers. It was 51.5 and 59.4 per cent in case of non-benefited and benefited *Lac* growers, respectively. The share of *Lac* income in total income has also increased in case of benefited *Lac* growers from 17.0 to 25.2 per cent. The share of labour income in total income has decreased from 21.3 per cent to 14.8 per cent. This is due to the more employment generation in improved method of *Lac* cultivation.

All calculations regarding cost of cultivation are based on the *Lac* cultivation on 50 host trees in case of *palas* and *ber* while in case of *kusum* it is based on 10 host trees. Table

**Table 2: Annual lac production by benefited and non-benefited lac growers (in percentage)**

| Type of growers | Production group | | |
|---|---|---|---|
| | <100 kg | 100-200 kg | >200 kg |
| **Sticklac production** | | | |
| Non-benefited growers | 59 % (37 kg) | 25 % (128 kg) | 14 % (280 kg) |
| Benefited growers | 51 % (69 kg) | 24 % (155 kg) | 25 % (320 kg) |
| **Broodlac production** | | | |
| Type of growers | Production group | | |
| | <50 kg | 50-100 kg | >100 kg |
| Non-benefited growers | 69 % (12 kg) | 18 % (58 kg) | 13 % (122 kg) |
| Benefited growers | 46 % (34.2 kg) | 29 % (86 kg) | 25 % (196 kg) |

*Figures in parentheses show the average annual production in respective group

**Table 3 : Source of farm and off-farm income of benefited and non-benefited lac growers (in percentage)**

| Particulars | Non-benefited growers | Benefited growers |
|---|---|---|
| **Farm income** | | |
| Foodgrains | 24.0 | 25.2 |
| Vegetables | 4.5 | 4.0 |
| Livestock | 6.0 | 5.0 |
| Lac | 17.0 | 25.2 |
| Sub total | 51.5 | 59.4 |
| **Off-farm income** | | |
| Salary job | 1.2 | 1.3 |
| Business/ shop | 4.0 | 3.5 |
| Forest produce | 22.0 | 21.0 |
| Labour | 21.3 | 14.8 |
| Sub total | 48.5 | 40.6 |
| Grand total | 100.0 | 100.0 |

4 indicates the physical input and output used in *Lac* cultivation on different hosts by benefited and non-benefited *Lac* growers. As evident from the table, number of man days, amount of broodlac (seed) and other inputs used in *Lac* cultivation increased for benefited *Lac* growers on all three hosts. About 86.0, 60.0 and 63.0 per cent more employment was generated in *Lac* cultivation on *palas*, *ber* and *kusum*, respectively by benefited *Lac* growers. Majority of *Lac* growers used their own broodlac for next crop. Trained *Lac* growers gave more emphasis on broodlac production over sticklac production. Higher level of broodlac production resulted in self sufficiency in broodlac and more utilization of host trees for *Lac* cultivation.

Table 5 indicates the returns in *Lac* cultivation on different hosts by benefited and non-benefited *Lac* growers. Both cost of cultivation and net return increased in case of benefited *Lac* growers but increase in net return was higher than cost of cultivation on all three hosts. Increased cost of cultivation was due to utilization of more labour and broodlac. Cost of cultivation was increased by 66.38, 97.30, 75.27 and 56.57 per cent, while net return by 185.25, 347.60, 133.37 and 118.50 per cent in *palas*, *ber-rangeeni*, *ber-kusmi* and *kusum*, respectively. Higher BC ratio was found in case of benefited *Lac* growers in comparison to non-benefited *Lac* growers for *Lac* cultivation on all three hosts. Regarding *Lac* cultivation on different hosts, highest BC ratio was found in both the cases *i.e.* benefited and non-benefited *Lac* growers for *Lac* cultivation on *kusum* followed by *ber-kusmi, ber-rangeeni* and *palas.*

The data in Table 6 indicate cost of production of broodlac and sticklac. It is evident from the table that the cost of production of broodlac and sticklac per kg. was reduced by benefited *Lac* growers in all three hosts. This reduction was due to the higher return at benefited *Lac* growers in all three hosts. For benefited *Lac* growers cost of production of sticklac was lowest in *ber-rangeeni* (Rs. 17.97) followed by *ber-kusmi* (Rs. 21.40), *kusum* (Rs. 21.89) and *palas* (Rs. 22.91). Cost of production of broodlac

**Table 4: Physical input and output used in lac cultivation on different hosts by benefited and non-benefited lac growers**

| Name of hosts | Input / Output | Particulars | Non-benefited lac growers | Benefited lac growers |
|---|---|---|---|---|
| | Input | Human labour | 22.0 Man days | 41.0 Man days |
| | | Broodlac | 30.0 kg | 42.0 kg |
| *Palas* | | Pesticide /sutli / net | Rs. 40.0 | Rs. 160.0 |
| (50 hosts) | Output | Sticklac | 48.0 kg | 79.0 kg |
| | | Broodlac | 62.0 kg | 158.0 kg |
| | Input | Human labour | 42.0 Man days | 67.0 Man days |
| | | Broodlac | 45.0 kg | 94.0 kg |
| *Ber-rangeeni* | | Pesticide /sutli / net | Rs. 85.0 | Rs. 400.0 |
| (50 hosts) | Output | Sticklac | 185.0 kg | 595.0 kg |
| | | Broodlac | 35.0 kg | 129.0 kg |
| | Input | Human labour | 42.0 Man days | 67.0 Man days |
| *Ber-kusmi* | | Broodlac | 62.0 kg | 104.0 kg |
| (50 hosts) | | Pesticide /sutli / net | Rs. 90.0 | Rs. 480.0 |
| | Output | Sticklac | 135.0 kg | 224.0 kg |
| | | Broodlac | 182.0 kg | 425.0 kg |
| | Input | Human labour | 35.0 Man days | 57.0 Man days |
| | | Broodlac | 37.0 kg | 54.0 kg |
| *Kusum* | | Pesticide /sutli / net | Rs. 90.0 | Rs. 410.0 |
| (10 hosts) | Output | Sticklac | 167.0 kg | 197.0 kg |
| | | Broodlac | 77.0 kg | 235.0 kg |

**Table 5 : Returns in lac cultivation on different hosts by benefited and non-benefited lac growers**

| Name of hosts | Particulars | Non-benefited lac growers (Rs.) | Benefited lac growers (Rs.) | Increase by benefited lac growers (%) |
|---|---|---|---|---|
| | Cost of cultivation | 4351.0 | 7239.0 | 66.38 |
| | Net return | 4109.0 | 11721.0 | 185.25 |
| *Palas* | Input-output ratio | 1.94 | 2.61 | 34.54 |
| (50 hosts) | Family labour income | 5249.0 | 13041.0 | 148.45 |
| | Farm business income | 5349.0 | 13381.0 | 150.16 |
| *Ber-rangeeni* | Cost of cultivation | 7047.0 | 13904.0 | 97.30 |
| (50 hosts) | Net return | 8128.0 | 36381.0 | 347.60 |
| | Input-output ratio | 2.15 | 3.61 | 67.91 |
| | Family labour income | 9928.0 | 38901 | 291.83 |
| | Farm business income | 10048.0 | 39251.0 | 290.63 |
| *Ber-kusmi* | Cost of cultivation | 12466.0 | 21849.0 | 75.27 |
| (50 hosts) | Net return | 25634.0 | 59821.0 | 133.37 |
| | Input-output ratio | 3.05 | 3.73 | 22.30 |
| | Family labour income | 27434.0 | 62341.0 | 127.24 |
| | Farm business income | 27554.0 | 62941.0 | 128.43 |
| | Cost of cultivation | 8231.0 | 12887.0 | 56.57 |
| | Net return | 18349.0 | 40093.0 | 118.50 |
| *Kusum* | Input-output ratio | 3.22 | 4.11 | 27.64 |
| (10 hosts) | Family labour income | 20029.0 | 41893.0 | 109.16 |
| | Farm business income | 20149.0 | 42213.0 | 109.50 |

**Table 6 : Cost of production of broodlac and sticklac on different hosts by benefited and non-benefited lac growers (Rs. /kg)**

| Items | Palas | | Ber- rangeeni | | Ber-kusmi | | Kusum | |
|---|---|---|---|---|---|---|---|---|
| | Non-benefited | Benefited | Non-benefited | Benefited | Non-benefited | Benefited | Non-benefited | Benefited |
| Sticklac | 30.86 | 22.91 | 30.18 | 17.97 | 26.18 | 21.40 | 27.87 | 21.89 |
| Broodlac | 46.29 | 34.36 | 41.79 | 24.88 | 49.08 | 40.13 | 46.45 | 36.49 |

was also lowest in *ber-rangeeni* (Rs. 24.88) followed by *palas* (Rs. 34.36), kusum (Rs. 36.49) and *ber-kusmi* (Rs. 40.13).

Significant increase was found in case of benefited *Lac* growers regarding adoption of improved *Lac* cultivation techniques. Adoption percentage of improved techniques by benefited *Lac* growers was 85.0 per cent for coupe system, 96.0 per cent for pruning of *Lac* hosts, 84.0 per cent for selection of good quality broodlac, 81.0 per cent for bundling of broodlac and tagging on plant, 100.0 per cent for *phunki* (used up broodlac) removal, 64.0 per cent for spraying of insecticide, 21.0 per cent for use of synthetic net and 55.0 per cent for spray of fungicide. Low adoption percentage was observed in case of spraying of insecticide and fungicide and use of synthetic net due to non-availability of these inputs in the local and nearby market.

## Conclusion:

The percentage of host utilization increased significantly in case of benefited *Lac* growers in comparison to non-benefited *Lac* growers. The average annual *Lac* production was increased in case of benefited in comparison to non-benefited *Lac* growers. Higher returns and employment generation was shown by benefited *Lac* growers. Benefited *Lac* growers gave more emphasis on broodlac production over sticklac production. BC ratio for *Lac* cultivation and adoption level of scientific techniques was found higher in case of benefited *Lac* growers in comparison to non-benefited *Lac* growers. Cost of production of broodlac and sticklac was reduced by benefited *Lac* growers by improved method of *Lac* cultivation. There is need for strengthening and widening the extension activity and developmental programme on *Lac* so that majority of *Lac* growers can be empowered with scientific knowledge on *Lac* cultivation and improved inputs to increase income and employment generation at farm level.

## Acknowledgment:

The financial assistance from Chhattisgarh State Minor Forest Produce (T&D) Co-operative Federation Limited, Raipur, Chhattisgarh for the project entitled 'Study for documentation of *Lac* production, processing in Chhattisgarh and market survey on *Lac* based products' is gratefully acknowledged.

## REFERENCES

**Pal, G., Jaiswal, A.K. and Bhattacharya, A. (2012).** *Lac*, plant resins and gums statistics at a glance 2012. Indian Institute of Natural Resins and Gums, Ranchi, JHARKHAND (INDIA).

**Roonwal, M.L., Raizada, M.B., Chatterjee, R.N. and Singh, B. (1958).** Descriptive account of the host- plant of the *Lac* insect, *Kerria lacca* (Kerr.) and the allied plants in the Indian region. (Parts 1&2), Indian *Lac* Cess Committee, Ranchi. 1-32.

**Sharma, K. Krishan, Ramani, R. and Mishra, Y.D. (1997).** An additional list of the host- plants of *Lac* insects, *Kerria* spp. (Tachardiidae: Homoptera). *J. Non -Timber Forest Products*, **4** (3/4) : 151-155.

**Varshney, R.K. and Teotia, T.P.S. (1967).** A supplementary list of the host plants of *Lac* insects. *J. Bombay Natural History Soc.*, **64** (3): 488- 511.