ESTIMATION OF LAC PRODUCTION AND PROCESSING IN INDIA

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Abstract

Lac is a natural resin secreted by the insect *Kerria lacca* (Kerr.), which thrives on the tender twigs of specific host trees *viz.*, *palas* (*Butea monosperma*), *ber* (*Zizyphus mauritiana*), *kusum* (*Schleichera oleosa*), *Ficus* spp. etc. It is a natural biodegradable product and finds wide utility in commerce and industry. It has high potential for generating employment in forest and sub-forest area for both men and women. With the timely and accurate estimation of lac production, the lac processors, lac traders, exporters, lac growers and policy makers can plan their operations in time. The present study was undertaken with an objective to estimate lac production and processing at national level and the study is based on primary data. The methodology for estimation of lac production and processing has been standardized considering all the lac produced at growers level passes through the market and the processing unit. So, lac markets and lac processing units are important from lac production estimation point of view. Efforts have been made at national level for data collection. Separate schedules / questionnaires were developed for lac markets and processing units. Surveys has been conducted in 32 lac growing districts of 8 states with 76 lac traders, 51 lac manufacturers / processors and 27 other key informants. The survey has been conducted in 2006-07 and 2007-08. The average estimated national production of sticklac was 21,935 tons. Chhattisgarh state ranks 1st followed by Jharkhand, Madhya Pradesh, Maharashtra and West Bengal. The above five states are contributing around 95 per cent of the national lac production. Eight districts have produces more than 1,000 tons of sticklac during the year. The average amount of sticklac processed was 29,345 tons which also included the amount of imported lac in India. National level constraints in lac production, marketing and processing were also identified.

Keywords: Lac; Production; Processing.

JEL Classification Codes: E2

1. Introduction

Lac is a natural resin secreted by the insect *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*), *Ziziphus mauritiana* (*ber*) and *Schleichera oleosa* (*kusum*), besides several other trees of regional importance (Roonwal *et al*. 1958; Roonwal and Singh 1958; Varshney and Teotia 1967; Sharma *et al.* 1997). Three natural, renewable, non-toxic and eco-friendly products *i.e.* resin, dye and wax are derived form the lac. *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). Lac is mainly cultivated in India, Myanmar, Thailand, parts of China, Taiwan, Indonesia, Philippines, Vietnam, Cambodia etc. India is the leader in production and export of lac in the world. Lac cultivation is an important source of income supporting livelihood for the forest and sub-forest dwellers. It has also high potential for generating employment for both men and women in forest and sub-forest area of the country. It is a very remunerative crop, paying high economic returns to the farmers and also foreign exchange to the country through its export. The export earning from lac and lac products during the year 2006-07 was around Rs. 148.0 crores (Pal and Bhattacharya, 2007). Lac is exported to more than 70 different countries, but the major markets are Indonesia, Germany, U.S.A., A.R.E., Spain, Bangladesh, Italy, Switzerland, U.A.E and U.K..

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Shellac, seedlac, dewaxed shellac, aleuritic acid, bleached lac, gasket shellac, lac dye, molamma lac and shellac wax are the forms of lac exported form India. Lac resin is a natural biodegradable product and finds wide utility in commerce and industry. The resin finds its use in various industries as adhesive, electrical insulators, varnish, printing ink, cosmetic, leather, food, automobile and pharmaceutical etc (Sarkar 2002). The dye obtained from lac is used in dyeing of wool and silk, soft drink, pill coating, confectionery and chocolate coating etc and has potential to be used as food additives. The lac wax is used in automobile and floor polish, bottle sealer, tailors chalk, fruit coating etc (Srivastava *et al.* 2006). A definite demand already exists for lac-derived materials, besides a tremendous potential for much higher consumption, due to global trend for safer natural products.

The cultivation of lac on a large number of hosts of different kinds, its collection by numerous small growers, the variations in the yield depending on the type and size of the host, the cultivation practices and seasonal conditions etc. pose serious difficulties in the estimation of actual production of this insect based crop (Sharan and Sundaram, 1956). Estimation of lac production is required by the Government, lac-based industries, lac traders, production entrepreneurs and exporters. With the timely and accurate estimation of lac production, the lac processors, lac traders, exporters, lac growers and policy makers can plan their strategies in time. The present paper attempts to throw light on the estimation of lac production, processing and constraints at national level in India.

2. Methodology

In estimation of lac production at national level, lac traders and lac processors (manufacturers) play a vital role. Hence, these respondents have been taken for detailed examination. The methodology for estimation of lac production and processing has been standardized considering all lac produced in country move through the lac trader. Big lac traders are limited in number. Big lac traders have close contact with the primary purchaser (village or *haat* level purchase) of lac who have knowledge of the present crop condition and expected output. All lac produced also passes through the lac processing units. These lac processing units are situated in sixteen locations of the country. Lac processors use current harvested sticklac or stocked sticklac or imported sticklac. So, lac markets and lac processing units are important for estimation of lac production and processing. Summation of market arrival of sticklac indicates the lac production figures in the states and country. Summation of all sticklac processed in different processing centers show the lac processing in India and it also helped in the validation of production data. The lac production year considered was from April to March.

Efforts have been made at national level for data collection. The relevant information was collected from selected lac traders and processors through a pre-tested questionnaire / schedule by survey methods for the year 2006-07 and 2007-08. Selection of lac markets has been made on the basis of catchment areas keeping in view that all lac produced in the catchment areas passes through the market. Survey has been conducted in all lac processing centers of the country. Survey has been conducted in 32 lac growing districts of 8 states with 76 lac traders, 51 lac manufacturers / processors and 27 other key informants. Details of sample size have been presented in Table 1. For updating the information and data regular contacts were also made through phone calls with the respondents.

Table 1: Sample size during the survey

State	District	Total number of samples		
		Number of traders	Number of manufacturers	Govt. Officials/ NGOs/ Other key informants
Chhattisgarh	11	25	16	5
Gujarat	-	-	-	1
Jharkhand	7	18	13	5
Madhya Pradesh	7	20	2	5
Maharashtra	3	5	4	6
Orissa	1	-	-	1
West Bengal	2	6	16	3
Total	**32**	**76**	**51**	**27**

3. Lac production scenario in India

On the basis of survey in the markets of different lac producing districts and states, the estimated average national production of sticklac for the year 2006-07 and 2007-08 was 21,935 tons. State-wise and crop-wise lac production figures have been presented in Table 2. Chhattisgarh state ranks 1st followed by Jharkhand, Madhya Pradesh, West Bengal and Maharashtra. The above five states are contributing around 95 per cent of the national lac production. Contribution of Chhattisgarh in national lac production was 36.55 per cent followed by Jharkhand (31.63 per cent), Madhya Pradesh (15.77 per cent), West Bengal (5.43 per cent) and Maharashtra (5.40 per cent). Regarding share of different hosts tree in lac production, *B. monosperma* contributed 52.88 per cent, *Z. mauritiana* contributed 9.79 per cent and *S. oleosa* contributed 33.12 per cent, and other minor hosts contributed 4.22 in national lac production. Minor lac producing states of the country are Andhra Pradesh, Assam, Bihar, Gujarat, Meghalaya, Orissa and Uttar Pradesh and are collectively contributing around 5 per cent in national lac production. The top 27 lac producing districts of different states contributed around 92 per cent in national lac production.

Table 2. Average lac production in India during 2006-07 & 2007-08 (in tons)

Name of state	Production of different crops				Total production
	Baisakhi	***Jethwi***	***Katki***	***Aghani***	
Andhra Pradesh	20	0	25	0	45
Assam	40	0	67.5	0	107.5
Bihar	7.5	0	5	0	12.5
Chhattisgarh	2,865	1,857.5	1,830	1,465	8,017.5
Gujarat	25	5	20	2.5	52.5
Jharkhand	1,395	1,380	2,092.5	2,070	6,937.5
Madhya Pradesh	1,570	427	1,127.5	335	3,459.5
Maharastra	465	0	720	0	1,185
Meghalaya	5	0	10	0	15
Orissa	102.5	125	80	130	437.5
Uttar Pradesh	325	0	150	0	475
West Bengal	347.5	107.5	615	120	1,190
TOTAL	**7,167.5**	**3,902**	**6,742.5**	**4,122.5**	**21,934.5**

Regarding share of different crops, *baisakhi* contributed 32.68 per cent in national lac production. Presently Chhattisgarh, Jharkhand and Madhya Pradesh states contributes 39.97, 19.46 and 21.90 per cent respectively in national *baisakhi* production. The *katki* crop contributed 30.74 per cent in national lac production and Chhattisgarh, Jharkhand and Madhya Pradesh states contributed 27.14, 31.04 and 16.72 per cent, respectively in national *katki* production. *Aghani* crop contributed 18.79 per cent in national lac production and Chhattisgarh, Jharkhand and Madhya Pradesh states contributes 47.60, 35.37 and 10.94 per cent, respectively in national *aghani* production. *Jethwi* crop contributed 17.79 per cent in national lac production and Chhattisgarh, Jharkhand and Madhya Pradesh states contributed 35.54, 50.21 and 8.13 per cent, respectively in national *jethwi* production. Eight districts of the country produce more than 1,000 tons of lac annually.

4. Processing of lac in India

On the basis of survey of different lac processing centers in the country the average amount of sticklac processed during 2005-06 and 2006-07 was 29,345 tons, which also included the amount of imported lac of 5,813 and 7,366 tons during 2005-06 and 2006-07. Twenty six lac processing units in Chhattisgarh, 25 units in Jharkhand, 7 units in Maharashtra and 145 units in West Bengal were in running condition during the year 2006-07. Amongst the states, West Bengal ranks 1st (39.60 per cent) followed by Chhattisgarh (31.27 per cent), Jharkhand (22.66 per cent) and Maharashtra (6.47 per cent) in the processing of lac. Lac processing centers in India and amount of sticklac processed at different lac processing centers in India has been presented in Table 3 and 4.

Table 3. Lac processing centers in India

State	District (center)	No. of processing units	Product manufactured
Chhattisgarh	Bilaspur (Pendra)	2	Seedlac, Button lac and Hand made Shellac
	Dhamtari	11	Seedlac, Shellac, Button lac, Bleached lac
	Jajgir-Champa (Sakti)	3	Seedlac, Shellac, Bleached lac, Dewaxed Shellac, Lac dye
	Kanker	2	Seedlac, Button lac
	Korba (Kathgora)	7	Seedlac, Shellac, Bleached lac
	Rajnandgaon	1	Seedlac, Shellac
Jharkhand	Palamau & Garhwa	8	Seedlac, Button lac
	Ranchi	14	Seedlac, Button lac, Shellac, Lac dye, Bleached lac, Aleuritic acid
	Simdega	1	Seedlac
	West Singhbhum	2	Seedlac, Shellac
Maharashtra	Gondia	7	Seedlac, Shellac, Gasket shellac, Bleached lac
West Bengal	Purulia (Balarampur)	95	Seedlac, Shellac, Button lac, Bleached lac, Aleuritic acid, lac wax, Dewaxed decolourised lac
	Purulia (Jhalda)	5	Seedlac, Shellac, Button lac
	Purulia (Tulin)	45	Seedlac, Button lac

Table 4. Average amount of sticklac processed in India during 2005-06 & 2006-07

State	Districts (Centers)	Quantity processed (tons)
Chhattisgarh	Bilaspur (Pendra)	200
	Dhamtari	3,150
	Janjgir-Champa (Sakti)	950
	Kanker	575
	Korba (Kathgora)	4,000
	Rajnandgaon	300
	Sub total	9,175
Jharkhand	Palamau & Garhwa	1,050
	Ranchi	4,900
	Simdega & Latehar	250
	West Singhbhum	450
	Sub total	6,650
Maharashtra	**Gondia**	1,900
West Bengal	Purulia (Balarampur)	10,900
	Purulia (Jhalda)	245
	Purulia (Tulin)	475
	Sub total	11,620
	Total	29,345*

* including the quantity of imported lac in India.

Production, marketing and processing constraints at national level

Production constraints

- Shortage of funds for purchase of inputs and high cost of broodlac.
- Lack of scientific knowledge on lac cultivation.
- Theft of lac.
- Shortage of broodlac.
- Insect mortality due to environmental factors and uncertainty in production.
- Lack of season specific host (owning only one species of host).
- Distance of host plant from home and scattered host plants.

Marketing constraints

- Lack of uniform policy regarding inter and intra state movement of produce.
- Non-availability of improved inputs in local markets.
- Lack of grading facility in the market.
- Long distance of market.
- Lack of information on current price of lac.
- No systematic channel for broodlac marketing.

Processing constraints

- Non-availability of skilled labourers especially during agricultural season.
- Irregular supply of electricity and high electric charges for mechanized units.
- Price fluctuation of raw material and finished products.
- Limited customers for marketing of finished products.
- Difficulty in sanction of bank loans and lack of subsidy to lac manufacturer.
- Adulteration in raw material.

5. Conclusion

The methodology for estimation of lac production and processing has been standardized considering all the lac produced at growers level pass through the market and the processing units. The estimated average national production of sticklac during the study was 21,935 tons. Top five states are contributing around 95 per cent of the national lac production. Regarding share of different hosts tree in lac production *B. monosperma* contributes 52.88 per cent, *Z. mauritiana* contributes 9.79 per cent and *S. oleosa* contributes 33.12 per cent, and other minor hosts contributes 4.22 per cent in national lac production. The average amount of sticklac processed during the study was 29,345 tons which also included the amount of imported lac of 5,813 and 7,366 tons during 2005-06 and 2006-07.

Acknowledgement

Authors are thankful to Dr. Bangali Baboo, Director, I.I.N.R.G., Ranchi for constant support and guidance during the study. Authors are also thankful to various lac industrialists, traders and other key informants for their valuable inputs, information and data.

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