

LAC CULTIVATION IN INDIA: II. LAC PRICES AT GROWERS LEVEL

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ABSTRACT

Lac is produced by an insect *Laccifer lacca* (Synonym: *Kerria lacca*; super family Coccoidea). There are about 160 tree species that serve as host but mainly reared on *Zizipus mauritiana*, *Schleichera oleosa* and *Butea monosperma* in India. Two strains- kusumi and rangeeni are prominently cultivated in India and both differ in their seasonal cycle. The variation observed in bimonthly prices was ascribed to seasonal harvesting rather than prices themselves. Prediction of price movement of mean sticklac was carried out for next five years by regression method on a linearity between export performance and current market dynamics indicates steady prices for sticklac in local markets however, with a slight decrease in prices at later stages ($R^2 = 0.53$). Similarly, local market fluctuations on current trend scenario will remain in future also ($R^2 = 0.44$). Regression of exported lac products predicted a steady export performance for next five years assuring retention of current domestic price trend. The demand in international markets for lac products will remain steady and may slightly increase due to awareness of consumers to use natural products in place of synthetic products. It is suggested that a support pricing policy may be adopted for lac-support price on annual basis.

Key words: Local market prices, Export of lac products, Natural products.

Introduction

Lac is produced by an insect *Laccifer lacca* (Synonym: *Kerria lacca*) which belongs to super family Coccoidea. It is mainly found in plains of India, Bangladesh, Myanmar, Thailand and Yunnan and Fujian provinces in China (Hwang, 1990). In India lac is mainly cultivated in Jharkhand, Chattisgarh, West Bengal, Maharastra, Madhya Pradesh and Odisha states. Lac dye is a scarlet pigment and extracted from resinous cocoon known as sticklac present in the live, pre-emergent insects *Laccifer lacca*. There are about 160 tree species that serve as host but it mainly reared on *Zizipus mauritiana* (Rhamnaceae), *Schleichera oleosa* (Sapindaceae) and *Butea monosperma* (Leguminaceae) in India. In Thailand, *Samanea saman* (family Leguminosae) is used as the main host tree (Takeda, 1990). Other important alternative host trees are *Albizia leucodermis* and *Flemingia macrophylla* (both belong to family Leguminosae) and *Hibiscus esculentum* (Malvaceae). In lac cultivation resting of trees in alternate years is practiced to enhance the lac yield and is followed in a coup system of management. Probably the same procedure prevents the host trees from developing resistance to the parasitic lac insects. Lac insects thrive well in wide range of climatic conditions with good amount of yield (Kher and Lakra, 1989) but extreme swings in climatic conditions adversely affect the colonization. Two strains-kusumi and rangeeni are prominently cultivated in India and both differ in their seasonal cycle.

Sticklac and its derivatives are cultivated in many parts of the world but the major producers are India, Thailand, and China. Among these countries, India and Thailand are major exporters of lac products while China consumes its entire production on domestic market. Once India produced about 50,000 Mt with its exports to the tune of 29,000 Mt. The major importers from India are Bangladesh (974 Mt), Egypt (840 Mt), Germany (688 Mt), Pakistan (612 Mt), Jordan (515 Mt) and USA (380 Mt) during 2009-10 (SEPC, 2010). Other countries such as Myanmar, Vietnam and Sri Lanka are minor producers but consume large quantities of lac products which are met through imports. There is an increasing trend in demand for natural products in international and domestic markets mainly induced by consumer driven demand due to their nonhazardous nature on human health as well as on environment. Lac is one such product and many hundreds of thousand people are dependent on lac cultivation in India (Anon., 2011). Therefore the prices of sticklac in local markets that farmers are getting and its dynamics are discussed in this communication.

Material and Method

Data has been collected from five states- Jharkhand, Chattisgarh, West Bengal, Maharastra and Uttar Pradesh throughout the year from local markets and local lac converting centers- from sticklac to shellac. The local markets are chosen in such a way that it should be in the centre of the lac growing belt and should have sufficient trading history. 41 such centers were selected

Prediction of price movement of sticklac indicated steady prices in local markets and a steady export performance for next five years.

from Jharkhand, Chattisgarh, West Bengal, Maharashtra and one district in Uttar Pradesh- Mirzapur. Data was collected for lac crops such as Baishaki, Jethwi, Katki and Aghani and the values are averaged for all centers for each crop. These mean values were used to estimate mean values of the price for a particular month. These overall mean values were used to draw regression curves and fluctuations in prices (CV). Regression has been performed assuming linear relationship between domestic lac cultivation, domestic consumption, export performance and international prices.

Results and Discussion

a) Variation in production and prices in local markets

Lac production has been estimated from 2003-04 to 2009-10 (Table-1). The total production varies from a high of 15430 Metric tones (Mt) during 2003-04 to a low of 6942 Mt during 2008-09 with a mean of 10908.29 Mt and Co-efficient of variation (CV) of 27.44 per cent. Exported volume has a range of 7451 Mt during 2007-08 to a minimum of 6423 Mt during 2009-10 with a mean of 7072 Mt and a CV of 5.78 per cent. Similarly, the net realized price at international market varies from a low of rupees 167.6/kg during 2007-08 to a high of Rs. 222.43/kg during 2006-07 with a mean price of Rs. 190.92/kg and CV of 12.28 per cent indicating narrow fluctuations in the international markets.

Production of lac in the five states is fluctuating year to year basis and Jharkhand maintains its prominent position in lac production (Table-2; Fig.1), there was a consistent increase from 2108 Mt in 2007-08 to 5402 Mt during 2009-10. Similar trend was observed in UP also. However, the total production from all states was

considerably varied. In the last three years, the total production varied significantly. It was 10092 Mt during 2007-08, 6943 Mt during 2008-09 and again increased to 11596 Mt during 2009-10 (Anon., 2011).

Similarly, there was wide fluctuation in the bimonthly price of sticklac at the local markets suggesting local market dynamics influence the price to a considerable extent (Table 3; Fig.2). However, the long term trend in mean bimonthly price fluctuate narrowly assuring that prices do not fall drastically and dampen the psychology of growers (Fig.3).

b) Prediction of demand for lac products and export performance

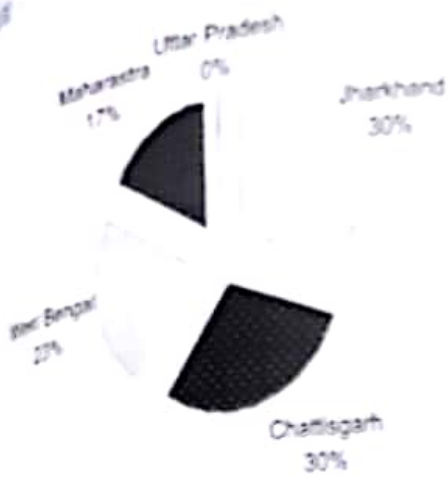
Prediction of price movement of mean sticklac was carried out for next five years by regression method assuming linearity between those variables and using the equation $y = mx + b$ on a simple assumption that export performance will remain robust and current market dynamics will prevail (Fig. 4). Straight line was obtained by least square method. The regression indicates steady prices for sticklac in local market, however, with a slight decrease in prices at later stages. The regression slope ($R^2 = 0.5251$) indicates the robustness of the prediction of prices. Similarly, to assess the local market fluctuations, linear regression was performed on current trend scenario as indicated by CV and predicted that the same market dynamics will remain in future elucidating the point that efforts are required to reduce the fluctuations in local prices (Fig. 4). Export of sticklac and its derivatives influences local market prices to a great extent. Therefore regression of exported lac products indicates a steady export performance for next five years and helps

Table 1 : Details of annual lac production, export and realized value (Source: SEPC, 2010).

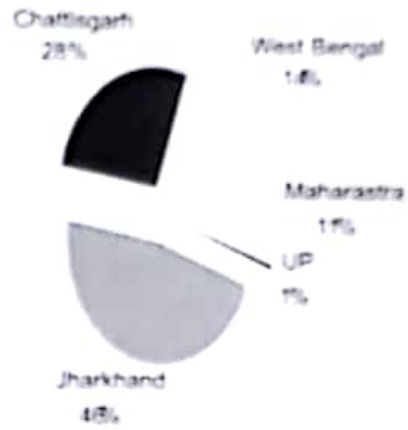
Year	Total production (in metric tones)	Exported volume (in metric tones)	Exported value (₹ in lakhs)	Realization per kg (in ₹)
2003-04	15436	6632	11470	173.08
2004-05	9593	7302	15638	214.18
2005-06	8679	7281	15262	209.71
2006-07	14020	7446	16562	222.43
2007-08	10092	7451	12487	167.60
2008-09	6942	6969	12415	178.14
2009-10	11596	6423	11002	171.31
Mean	10908.29	7072	13548	190.92
CV(%)	27.44	5.78	16.4	12.28

Table 2 : Total lac production and state's contribution (Data from various sources).

State	2007-08 (in MT)	2008-09 (in MT)	2009-10 (in MT)
Jharkhand	2108	3776	5402
West Bengal	1616	1334	1575
Chattisgarh	2054	3599	3265
Maharashtra	1155	1365	1280
Uttar Pradesh	10	18	74
Total	10092	6943	11596

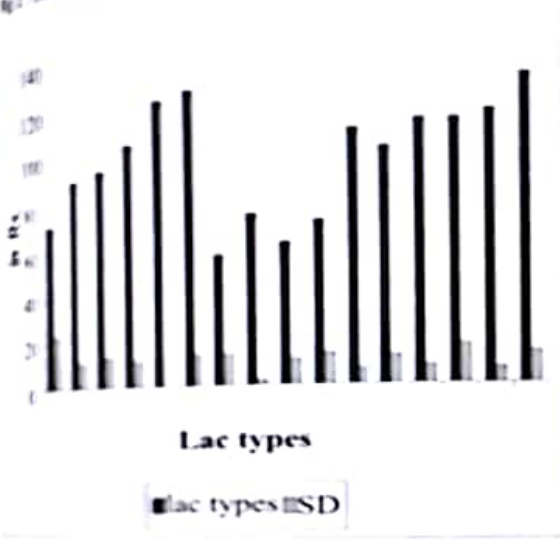


(a)

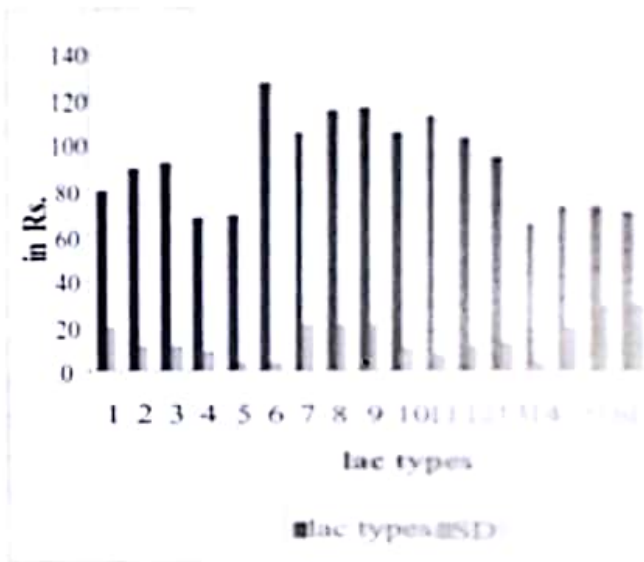


(b)

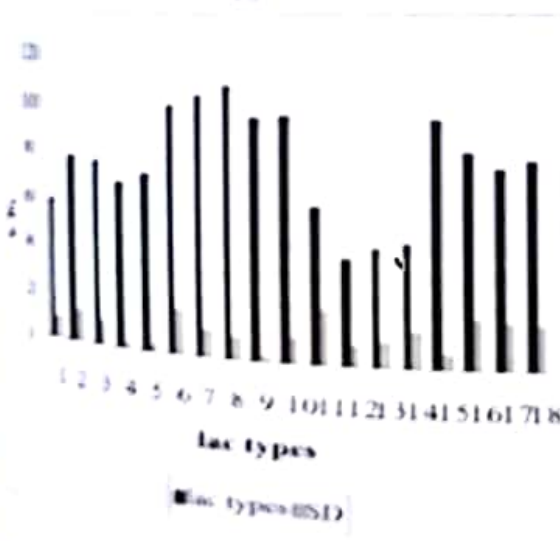
Fig 1. Lac production in different states in India: a) during 2008-09, b) during 2009-10



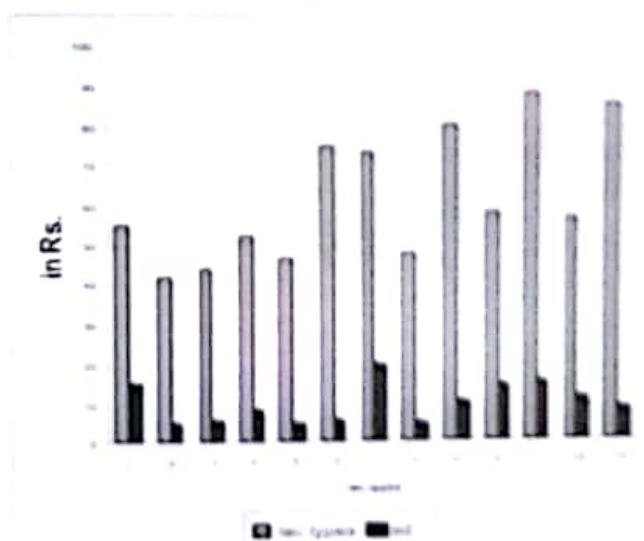
(a)



(b)



(c)



(d)

Fig 2. Price movements of sticklac (Basaki, Jethwi, Katki and Aghani) at various local markets where farmers bring their produce in Jharkhand, Chattisgarh, West Bengal and Maharashtra: a) Mean Price movement of sticklac during 2006-07, b) Mean Price movement during 2007-08, c) Mean Price movement of lac during 2008-09, d) Mean Price movement of lac during 2009-10.

Table 3 : Bimonthly price movement of sticklac at grower's level in Jharkhand during 2007-08 2008-09 and 2009-10 (Rates collected from 41 market places from five states)

Year/ Month	2007-08 (in ₹)		2008-09 (in ₹)		2009-10 (in ₹)	
	Range	Mean	Range	Mean	Range	Mean
Jan	35-103	70.77	60-145	80.78	40-111	77.25
Apr	50-118	85.88	45-115	78.39	30-80	52.59
Jul	60-120	88.28	60-135	95.74	35-60	41.69
Aug	60-122	69.44	83-135	99.63	38-60	48.20
Sept	46-100	56.31	50-110	72.06	40-70	49.85
Oct	33-105	56.33	65-110	80.14	35-93	65.59
Dec	35-103	58.79	60-110	84.64	40-96	69.34

In retaining the current price trend in domestic market (Fig.5).

Discussion

Much of the variation observed in bimonthly prices was ascribed to seasonal harvesting rather than prices themselves. Katki and Aghani crops were harvested during September to January and their quantity of harvest were generally less compare to Baishaki and Jethwi crops which fall during April to August. During 2009-10, the share of Baishaki crop was 3095.5 Mt, Jethwi- 4045.5 Mt, katki- 1820.7 Mt and Aghani was 263.5 Mt indicating seasonal differences in the harvest (Anon., 2011). Another aspect relating to total production has to be considered while analyzing the lac output state-wise production of which considerably varied from year to year. It is mainly due to seasonal changes in environmental factors accompanied with their erratic behavior. Long spell of higher temperature days is likely to reduce the lac production (Kher and Lakra, 1989; Hwang, 1990).

Regression model for prediction of lac prices for next five years suggested a gradual but negligible

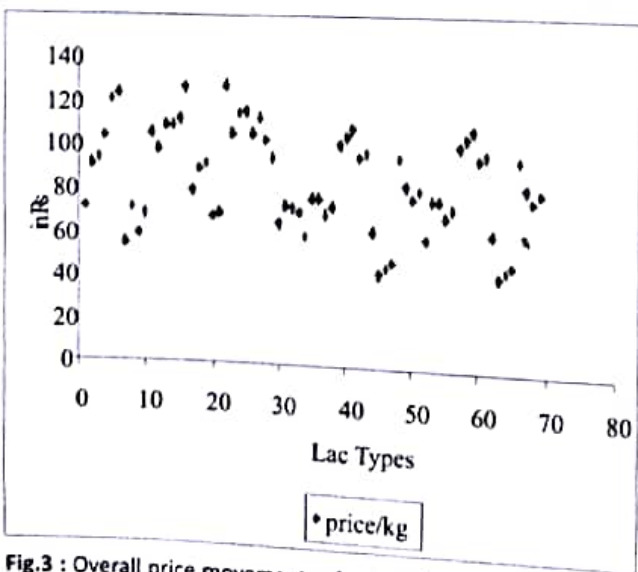


Fig.3 : Overall price movements of Sticlac (Baisaki, Jethwi, Katki and Aghani) at various local markets where farmers bring their produce in Jharkhand, Chattisgarh, West Bengal and Maharashtra from 2006-07 to 2009-10.

reduction which is mainly due to reasons such as variations in environmental factors. The regression coefficient ($R^2=0.5$) is considerably high indicating the robustness of the prediction model. The prediction model for the coefficient of variation in local market prices suggest that those factors will remain stagnant and the regression model is robust ($R^2=0.44$) (Fig. 4). Therefore sufficient techniques of market interventions are required in the form of regulated market where base prices are determined and with centralized marketing areas.

Variation in total production of sticklac in some states can be minimized to a certain extent through developing sustainable forestry. Though sufficient host species are already available, host management techniques may be enhanced for intensive lac culture so that harvest per tree can be increased significantly. That can be achieved through refining lac management

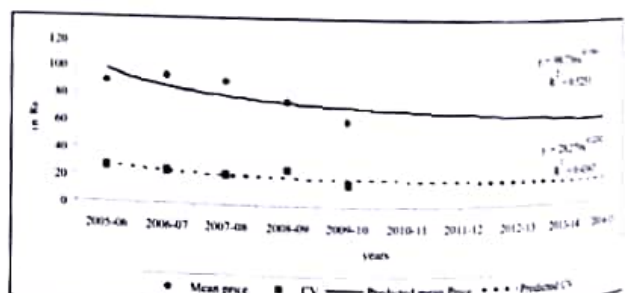


Fig.4 : Prediction of mean sticklac (Baisaki, Jethwi, Katki and Aghani) price movement at various local markets where farmers bring their produce in Jharkhand, Chattisgarh, West Bengal and Maharashtra for next five years.

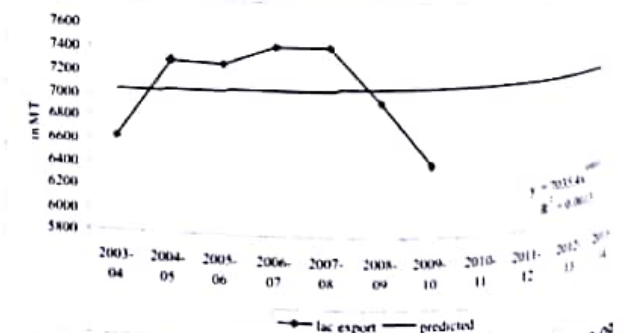


Fig.5 : Export of lac and its products during 2003-04 to 2008-09 and prediction for next five years

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techniques including pest and diseases and predators. Further, there is a need of development of integrated pest management program since use of excessive pesticides may affect the quality of sticklac. Significant pesticide residues in lac products may subject to rejection by importing countries.

Prediction of trend in export performance will remain steady suggesting that efforts must be accelerated to increase the lac production (Fig.5). The demand in international markets for lac products remains robust and even slightly increases due to

awareness of consumers to use natural products in place of synthetic products due to their non-hazardous nature on human health and environment (Debroj and Pathak, 1971; Sumita *et al.*, 2011). Since, a good competition is building up in export markets due to entry of China with its lac products (SEPC, 2010) and considerable variation in total lac production, efforts to increase the lac production must be accelerated. In the meantime, fluctuations in prices at the local markets must be minimized through proper interventions to ensure better prices for growers.

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भारत में लाख की खेती : ॥ उत्पादकों के स्तर पर लाख का मूल्य
सुमिता सरकार, अमित कुमार साह, एच.सी. सिंधु वीरेंद्र तथा रूनी एम. कुजुर
सारांश

लाख का उत्पादन एक कीट लेसीफर लाका (पर्यायवाची : कैरिया लाका, मुख्य कुल कोकोडिया) द्वारा किया जाता है। करीब 160 वृक्ष इस कीट के हैं किन्तु भारत में यह मुख्यतः जिजीपस मैरुटियाना, स्कंलीक्रेग आंलिओसा तथा व्यूटिया मांनोम्यमा पर पनपता है। भारत में मुख्यतः कुमुमों और रंगनों से इसे उगाया जाता है और ये दोनों अपने मौसमीय चक्र में भिन्नता रखते हैं। इसका मूल्य दो महोनों के अन्तर्गत में मौसमीय फसल के आधार पर तय किया जाता है। प्रतिगमन पद्धति से लाख दण्डिका का मूल्य आने वाले पांच वर्षों के लिए आकलित किया जाता है और निर्यात निष्पादकता तथा वर्तमान बाजार मूल्य के आधार पर बाजार में सम्भावित हल्की सी गिरावट को बाद की परिस्थितियों (आर = 0.53) हेतु ध्यान में रखा जाता है। इसी प्रकार, वर्तमान प्रवृत्ति के परिदृश्य में स्थानीय बाजार का उतार-चढ़ाव भविष्य में (आर = 0.44) रहेगा। वर्तमान छूटे मूल्य प्रवृत्ति को सुनिश्चित करते हुये आगामी पांच वर्षों में निर्यात के लिए लाख की स्थाई निष्पादकता का पूर्वानुमान किया जाता है। अन्तर्राष्ट्रीय बाजार में लाख उत्पादों को मांग स्थिर रहेगी और कुछ उपभोक्ताओं को सयिलस्ट उत्पादों की वजाय लाख के प्राकृतिक उपयोग के प्रति जागरूक करने पर निर्यात की हल्की सी मांग बढ़ सकती है। सलाह दी जाती है कि लाख के समर्थन मूल्य को वार्षिक आधार पर तय करना चाहिए।

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