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Unlocking the potential of lac cultivation: A strategic approach to marketing dynamics using value chain mapping

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Abstract

With India's immense lac resource potential, this diversified "low volume high value" crop serves as a sustainable source of income for the tribal community's existing livelihood options. Keeping this in view, the current study attempts to map the existing lac value chain of seedlac in the two major lac-producing districts of Jharkhand (Ranchi and Khunti) to understand its market dynamics and value addition. The analysis articulated the existence of two marketing channels in the study area (C1: Producer-Village Merchant-Wholesaler-Processor-Consumer and C2: Producer-Wholesaler-Processor-Consumer). Value chain mapping revealed that the maximum degree of value addition occurs in the processor stage. Although the level of value addition in both channels did not differ considerably, the lac grower's income was observed with a significant difference (₹75000 per quintal in channel I and ₹80000 per quintal in channel II). The findings stressed the need for strong policy integration in the existing value chain of lac to move this sector towards a profitable line. Capitalizing on the untapped potential of lac cultivation by strengthening the marketing structure and encouraging primary processing at the rural level through effective training and technology dissemination will significantly uphold the contribution of this potential sector to the livelihood security of these tribal lac growers.

Keywords: Tribals, Lac cultivation, Seedlac, value chain mapping, marketing channels

Introduction

Due to the substantial existence of tribal communities in forest fringe-dominated areas in the country's tropical belt, forest products play an important role in balancing their social life and paying the way for their economic well-being (Kumar *et al*., 2022) [4]. Among all the available forest resources, Non-Wood Forest Products (NWFPs) that include Natural Resins and Gums (NRGs) such as lac, pine resin, guar gum etc., tendu leaves (*Diospyros melanoxylon*), turpentine, bamboo, perfumery oils, honey, mosses and exudates from root, stumps and fruits of various tree species provides for around 70-75 per cent of India's forest export earnings, with most of it coming from raw and unprocessed forms and also creates 55 per cent of forest-based employment in India (Singh *et al*., 2020) [15]. This clearly highlights the significant contribution of NWFPs to the economic sustenance of the tribal population and to the forest economy of developing and developed countries on a broader line.

The natural resin secreted solely by an Indian lac-scale insect known as *Kerria lacca* (Kerr) positions India as the world's largest animal-based naturally secreted resin supplier. This natural resin possesses profound properties, including renewability, biodegradability, versatility and non-toxicity (Singh *et al*., 2021) [14]. Over the last few decades, "Lac" has gained commercial importance since it provides a sustainable source of income even during the lean agricultural season. Enriched biodiversity across the Indian agro-forestry ecosystem supports about 49.2 crores of *Palas* (*Butea monosperma*), 3.7 crores of *Kusum* (*Schleichera oleosa*) and about 4.5 crores of Ber (*Ziziphus mauritiana*) as the major lac host trees (ISFR 2021) [2]. In addition to these major hosts, *Flemingia semialata* and *Ficus* spp. have been identified and established as good *kusumi* lac hosts. Based on their predilection for specific host plants, strains of lac insect are classified into two types, namely *Rangeeni* and *Kusumi*. However, *Kusumi* lac is regarded as one of the finest commercial lac since it attracts better prices in domestic and global markets (Latika, 2020) [7].

Globally, India is one of the major producers of lac, with more than 99 per cent of Indian lac coming from the Eastern plateau and hilly region of India, which includes 63 districts in six major states namely Jharkhand (54.60 per cent), Chhattisgarh (22.4 per cent), Madhya Pradesh (11.5 per cent), West Bengal (6.7 per cent) and Maharashtra (4.8 per cent) (Kumari *et al*., 2024) [6]. Jharkhand is regarded as the "Lac state of India" owing to its extensive forest area, natural resource endowment, and suitable agro-climatic conditions for lac production. This favourable situation also allows for a steady supply of lac-based natural products to meet domestic and foreign market demand. The global market for lac-based products is expanding, which has created the potential for entrepreneurs to add value to these through processing, thereby generating enormous employment avenues. The Pharmaceutical, food, textile,

cosmetic, electrical, and adhesive industries are the prime sectors where considerable amounts of resins are still being used owing to their biodegradable and non-toxic nature (Sharma *et al*., 2022) [13].

Sticklac, or scrapped lac, is the primary raw material used in the lac processing industry. It is usually collected either as broodlac (mature lac), *ari* (immature lac) or *phunki* (used up broodlac) from lac host trees. The lac processing sector may be grouped into two categories: primary processing and secondary processing units. In the former, sticklac is transformed into the semi-refined product known as seedlac through six major unit operations, *i.e.* crushing, sieving, washing, drying, winnowing and grading. In the later stage, through secondary processing, seedlac is processed into lac-based products like button lac, shellac, bleached lac, aleuritic acid, etc.

"Competitive Advantage: Creating and sustaining superior performance", published in 1985 by Michael Porter, popularized the term value chain, which he used to explain how firms might gain "competitive advantage" by creating value across their organization (Seward, 2021) [12]. Consequently, the concept was adopted to achieve the objectives of agricultural growth. It has since been gaining popularity among individuals working in this sector, with an increasing number of bilateral and multilateral assistance organizations utilizing it to direct their efforts to foster prosperity (Kumar, 2018) [5]. The value chain can be referred to as a full array of activities performed by the core and supporting actors and their interlinkage to deliver a good or service from conception to disposal to the end consumers (Pedro *et al*., 2016) [10]. Keeping in view the importance of lac sector in generating long-term sustainable livelihoods in the tribal belts of Jharkhand, the present study was conceptualized and conducted to have an in-depth understanding of the value chain of lac in the study area by capturing all the actors, activities and their functional linkage. The findings of the study would be helpful to researchers and policymakers in understanding the existing situation and identifying strategic and policy approaches for expanding the lac value chain on a profitable line.

Materials and Methods

Jharkhand, India's top producer of lac, underscores the crucial contribution of lac cultivation to the state's agricultural domain. In order to have a holistic understanding of the prospects of lac cultivation in the state, the study was conducted in two major lac-producing districts, namely, Ranchi and Khunti, during 2023-24 using ex-post-facto research design. Based on production level, 3 blocks from each district were purposively selected and then, using random sampling 150 tribal lac growers were selected from each district. In addition, to capture the market dynamics in the study area, value chain actors, namely 16 village merchants, 4 wholesalers and 6 processors were also sampled using a semi-structured interview schedule method.

As seedlac is the primary processed product in lac processing industry which later serves as the mother material for other lac-based products, a modest attempt has been made to analyze the value chain of seedlac in Jharkhand. The analysis included both qualitative and quantitative approach. From the study area, the actors' activities along the value chains and their linkages were identified. The quantitative analysis was carried out systematically using the prevailing market price of sticklac/scrapped lac as observed at the time of data collection (during 2023-24) as the base. Finally, an illustrative methodology of value chain mapping with the graphical representation of actors, functions, degree of value addition, and their interconnection was adopted to explore the linkages among the tribal lac growers with the market structure.

Marketing cost

The marketing costs were estimated using the following formula:

$$TC = C_G + \sum MC_i$$

where,
TC= Total cost of lac marketing (₹ /q)
C_G = cost incurred by the lac grower in the marketing of lac (₹ /q)
MC_i = Marketing cost incurred by the i^{th} middleman (₹ /q)

Marketing margin

The marketing margins of the intermediaries were computed as the difference between their total payments (purchase price + marketing cost) and receipts (selling price) utilizing the following formula:

$$AM_i = SP_i - (PP_i + MC_i)$$

where,
AM_i = Absolute margin of the i^{th} middlemen
SP_i = Selling price of the i^{th} middlemen (₹ /q)
PP_i = Purchase price of the i^{th} middlemen (₹ /q)
MC_i = Marketing cost incurred by the i^{th} middleman (₹ /q)

Price Spread

The price spread was estimated as the difference between the price paid by the end consumer (here, the manufacturer or processor) and the price received by the lac grower. Price spread is often used to assess the economic effectiveness of a marketing system. The smaller the price spread, the more efficient the marketing system.

Producer's share in consumer's rupee

It is the price received by the lac grower expressed as a percentage of the consumer price. It is calculated as:

$$P_s = (P_f / P_c) \times 100$$

Where,
P_s = Producer's share in consumer rupee
P_f = Producer's price
P_c = Consumer price

Marketing Efficiency

The marketing efficiency of active marketing channels in the study area was calculated by using Acharya's method.

$$MME = FP/(MC + MM)$$

where,
MME = Modified measure of marketing efficiency
FP = price received by the lac producer
MC = Total marketing cost
MM = Net marketing margins

Processing cost of seed lac
Based on the data collected from the active processing units in the study locale, the cost of processing seedlac was estimated using tabular analysis. Seedlac's total processing cost encompasses both fixed cost and variable Costs (Mohapatra, Sendhil, and Pabba, 2022) [9].

$$Total\ cost\ of\ processing = Total\ Fixed\ cost + Total\ Variable\ cost$$

Degree of value addition
Value added is the additional value created by market intermediaries over and above the initial value of the product. In other words, it is a modification made to a product by an individual before giving it for sale to the end customer.

$$Degree\ of\ value\ addition = \frac{Marketing\ margin\ by\ any\ intermediaries}{Purchase\ price\ of\ product} \times 100$$

Mapping
Mapping is a critical component of value chain analysis that links the flow of products from sourcing raw materials and inputs to production, processing, marketing, and final sales. The maps were also used to illustrate the costs, value addition at each stage, and enabling value chain services (Sah *et al*., 2022) [11].

Results And Discussion

Processing scenario of Lac in India
Matured lac, after being harvested from trees in the form of sticklac are manually scraped to separate lac incrustation from it and then sent to processing units in the form of scrapped lac. It is subsequently processed into a semi-finished product known as "seedlac" or "*Chouri*" in the local dialect. The initial stage is to convert sticklac/ scrapped lac into seedlac using various unit operations under primary processing; therefore, seedlac is also known as "mother raw material". Further, seedlac is utilized to make lac-based value-added products like shellac, button lac, bleached lac, etc. The total quantity of sticklac processed during 2020-21 was 21,376 tonnes, including the imported lac in India. The total quantity of sticklac processed in India over the last ten years is presented in Table 1. Based on lac processing across the country for the year 2020-21, West Bengal holds a major share of 42.66 per cent, followed by Jharkhand (22.55 per cent), Chhattisgarh (20.16 per cent), Maharashtra (8.5 per cent), Madhya Pradesh (2.9 per cent) and others (3.21 per cent). A similar pattern is witnessed based on states with functional processing units. With respect to the processing units distributed across the state of Jharkhand, the majorly produced value-added products are seedlac, and button lac. At the same time, a few processing units also deal with other lac-based products like shellac, lac dye and bleached lac. Lac and lac-based products hold enormous potential for entrepreneurship development and employment generation at the village level through small-scale industries.

Table 1: Amount of sticklac processed in India from 2011-12 to 2020-21

(in tonne)

State	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Chhattisgarh	5435	5630	6900	4770	3815	5270	3618	3989	4065	4310
Jharkhand	3370	3580	6865	4920	3650	4594	4091	4380	4670	4820
Madhya Pradesh	125	80	74	150	200	80	720	555	650	630
Maharashtra	1000	900	1500	1950	1430	1776	1685	1740	1850	1810
West Bengal	5962	4404	6810	7343	9308	4710	5524	7289	7002	9120
Others	-	-	-	159	383	248	518	737	510	686
India	15892	14594	22149	19292	18786	16978	16156	18690	18747	21376
YoY change (%)	16.9	-8. 2	51.8	-12.9	11.8	-9.6	-4.8	15.7	0.3	14.02

(Source: DGCIS)

Processing cost of seedlac in the study area
The procurement process of raw material by the processor involves a method known as *chouri partha* method. This approach entails a testing procedure in which the value of one *maund* (40kg) of sticklac is determined based on the recovery or yield of seedlac per *maund* of stick lac. Several parameters impact the yield and quality of seedlac obtained from sticklac, including the host species, harvesting season, type of lac (*phunki* or *ari*), contaminants, and washing procedure (Mandal, 2014) [8].
All costs incurred by the processor from the point of procurement of raw material (sticklac or scrapped lac) until the product (seedlac) was produced were categorized and further worked out to determine the processing cost. For the processing of seedlac, the entire computation was based on the design capacity of the washer (360 kg). The quantity of sticklac used for processing is presented in Table 2. The quantity of seedlac produced from 360 kg of sticklac was about 234 kg, with a recovery rate of 65 per cent.

Table 2: Quantity of sticklac used for processing

Particulars	Quantity
Raw material processed (kg)	360
Purchase Rate (₹/kg)	950
Raw material price (₹)	342000
Recovery (per cent)	65
Total seedlac produced (kg)	234

The cost incurred in conversion of sticklac to seedlac was worked out and is presented in Table 3. The result revealed that raw material procurement accounts for a significant proportion of the total cost incurred. This is in correlation

with the findings of (Karthick *et al*., 2013) [3], who stated that processing industries are raw material intensive, *i.e.* raw materials form the major component of total processing cost. Among the fixed costs, the major cost share was from interest on fixed capital (84.6 per cent) followed by depreciation (15.4 per cent). In total variable cost, the cost on account of raw material was the major cost component, followed by the labour charges. The processing cost of seedlac amounted to ₹7.60 per kg.

Table 3: Average processing cost of seedlac

Sl. No	Particulars	Unit	Expenditure
Variable Cost			
1.	Sticklac/scrapped lac	Kg	3,42,000
	Transportation cost	Rupees	90
2.	Caustic Soda @80/kg	Kg	100.80
3.	Power, Fuel and Water	Rupees	720
4.	Labour charges (Crushing and Washing) @ ₹270/day (2 labours)	Rupees	540
5.	Labour charges (Sorting and Grading) @₹225/day (5 labours)	Rupees	1125
A	Total Variable Cost	Rupees	344575.80
Fixed Cost			
1.	Interest on fixed capital (10% per annum)	Rupees/day	140.25
2.	Depreciation	Rupees	25.47
B	Total fixed cost	Rupees	165.72
	Total processing cost (A+B)	Rupees	344741.52
	Total processing cost per kg of sticklac	Rupees	7.6

Identifying the main actors involved in lac value chain

The technique of value chain mapping is initiated by identifying the actors and their roles in lac marketing. Therefore, this procedure used a typical generic worksheet cross-function; the results are presented in Table 4. The actors' roles are represented by colour-blocking the table's cells.

Actors and their role in lac value chain

Input Suppliers: Key inputs for lac cultivation, such as broodlac, fertilizer and plant protection chemicals, were mostly supplied by private agencies in the study area. It was also observed that most of the sample lac growers who bought broodlac utilized their own broodlac as inoculants year after year or bought from fellow lac growers in the village.

Producer

Lac growers are a major factor in the lac value chain. Lac growers select suitable host trees and cultivate them by inoculating them with broodlac, which thrives on the tender twigs of the host trees. To ensure a good harvest, they practice the removal of used-up broodlac sticks i.e. *phunki*, integrated pest management and subsequently harvesting of the mature lac in the form of stick lac, and later carry out scrapping of lac encrustations from the stick lac to get scrapped lac, bag it and ultimately deliver it to the nearby market destination, i.e. local market/*haat* or town market.

Village Merchant (*Paikars*)

Village merchants (*paikars*) are the primary market functionaries involved in purchasing and selling sticklac or scrapped lac from the lac grower. Usually, lac growers in the study area bring the produce in small quantities (lot size of less than 10 kg). Subsequently, the *paikars* aggregate this produce into bigger lots and sell it to the wholesalers or nearby processing units.

Wholesale: Wholesalers are those specialized market functionaries involved in buying and selling produce in large quantities. After purchase from village merchants or directly from lac growers, they sell their purchase to processors at different lac processing centres.

Processing unit

Processors are the primary actors in the lac value chain that create the form of utility of the commodity. They purchase sticklac/scrapped lac in larger quantities (minimum lot size of 100kg) from wholesalers or village merchants and process them into a range of products like seedlac (*chouri*), button lac, shellac and other lac-based products. In the study area, processors were directly involved in the trading and exporting value-added products.

Enablers and Facilitators

The enablers and facilitators in a value chain encompass all chain-specific actors who provide regular support services or represent the value chain actors' common interests. For example, functions at the enabler level include public research and technology development, promotional services, joint marketing or other support service providers.

Enablers in production

Government and other non-governmental organizations offer their services in producing and processing lac. ICAR-NISA, Namkum, KVKs, and other active NGOs like Tata trusts, Ramakrishna Mission, Udyogini, and ICICI Foundation provide technical and extension support to lac growers in the study area by disseminating information on various scientific technologies and approaches in cultivation and processing.

Enablers in trading

The Jharkhand State Co-operative Lac Marketing & Procurement Federation Limited. (JASCOLAMPF), Ranchi and The Tribal Co-operative Marketing Development Federation of India Limited (TRIFED), New Delhi, facilitate fair trading activities with/without intermediaries

at the marketing level. Shellac and Forest Products Export Promotion Council (SHEFEXIL) assists in the export of lac and maintains the export-related data.

Table 4: Generic worksheet crossing functions to identify the actors in lac marketing

Functions	Functionaries/Actors						
	Private Input Suppliers	SHGs	Fellow Farmers	Farmers	Village merchant (Paikars)	Wholesaler	Processor
Input							
Production							
Procurement							
Processing							
Export							

Mapping of existing channels for marketing of lac

Understanding the marketing dynamics provides adequate incentives for the lac growers to increase the lac production. In the supply chain, all the lac produced at the grower's level goes to the processers, where sticklac/scrapped lac is processed into seedlac, button lac, shellac, or other lac-based value-added products. In the study area, more than 90 per cent of the lac entered the market as scrapped lac. During the study, it was found that the disposal of scrapped lac was much unorganized, with mostly private agencies such as village merchants (*paikars*) and wholesalers involved. The following two active lac marketing channels were observed in the study area.

Channel I: Producer →Village Merchant (*paikar*) → Wholesaler → Processor→ Consumer

Channel II: Producer → Wholesaler → Processor→ Consumer

The manufacturers of different industries were considered as the consumers involved in the lac value chain. This included manufacturers of both domestic territory and foreign countries. It can be well deduced from Figure 1 that in the marketing of lac in the sample area, channel I was the most preferred channel, which accounted for 96.0 per cent of total market produce, followed by Channel II, which accounted for only 4.0 per cent of total market produce. This is because lac growers mostly relied on the village merchants operating in the local market, and only a few lac growers who had better knowledge about the marketplace and better prices preferred Channel II. Although lac growers in the study area had opportunities to see their produce directly to the processing units or JASCOLAMPF, they hardly went to sell because of their instant need for money. Due to logistic limitations, they prefer to sell in local or town markets. A similar type of marketing channel in the lac value chain was reported by Sinha *et al*. (2021) [16].

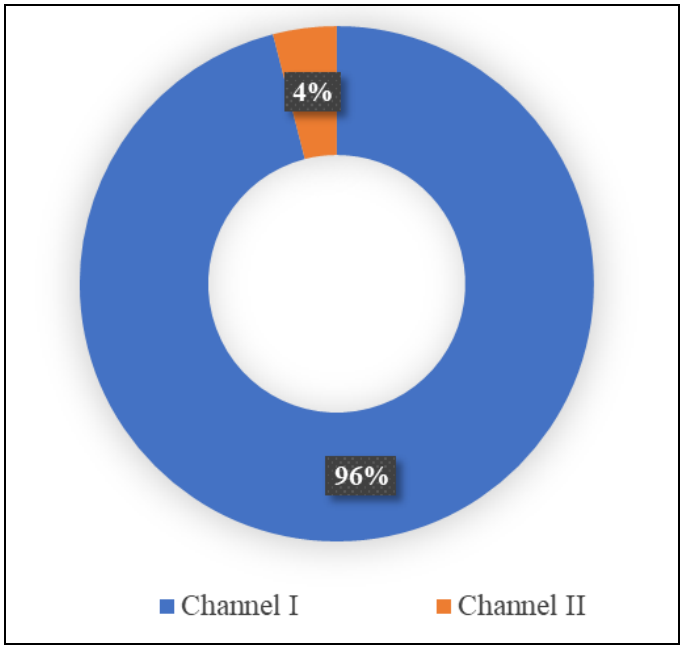

Fig 1: Percentage share of sticklac/ scrapped lac sold in the active marketing channels

Quantitative analysis of lac value chain and its mapping

The relative contribution of different activities in adding value along the active lac value chains was assessed and the results are presented in Table 5. In both the sample districts for Channel I, as lac producers were selling the produce directly to the *paikar* operating in the village or nearby markets, they did not incur any expenditure towards the marketing of lac. In this channel, the major share in total marketing cost was incurred by the processor (64.44 per cent), followed by the wholesaler (24.85 per cent), and the village merchant (10.70 per cent). The marketing cost incurred by the village merchant was ₹280 per quintal. Here,

the major cost incurred was the transportation cost (72.86 per cent) followed by labour charges for loading and unloading (20.0 per cent) and the handling or storage cost (7.14 per cent). Wholesalers incurred a cost of ₹650 per quintal towards marketing lac. Transportation, followed by the handling cost, was the major cost component at this node. As the storage duration was likely longer at this level, handling costs due to moisture were higher than those of the village merchant. Further, the raw lac makes its way to the processing unit for primary processing to obtain seedlac and incurs high marketing and value addition costs in the value chain. The marketing and processing costs incurred by the processor were ₹1685.65 and ₹760 per quintal.

In Channel II, on average, the lac producer incurred a cost of ₹185.20 towards marketing a quintal of lac. In this channel, the wholesaler was directly involved in the procurement of lac from the producer. A major share (72.89 per cent) of the wholesaler marketing cost was contributed by transportation costs costing about ₹468 per quintal, followed by handling costs (15.57 per cent) and loading and unloading charges (11.54 per cent). In this channel, the processor also incurred the highest marketing cost of ₹1657.80 per quintal, about 66.71 of the total marketing cost of the channel. Out of the different cost components, the highest cost (45.84 per cent) was incurred in processing, followed by transportation cost (38.12 per cent), handling cost (6.64 per cent), loading and unloading charges (5.19 per cent), miscellaneous charges (2.51 per cent) and packaging charges (1.70 per cent). A close perusal of both the existing channels confers that the village merchant and wholesaler were the core actors in the marketing of lac, and the processor was the leading actor in taking up both the marketing and processing cost in the lac value chain.

The marketing efficiency of the identified value chains was calculated using Acharya's modified measure of marketing efficiency, and it is evident from Table 5 that channel II had high efficiency (1.99) as compared with channel I (1.54) even though the marketing margin was less for this channel as compared with the channel 1. Similar results on marketing efficiency were reported by Yogi *et al*. (2017) [17] in their study on the marketing efficiency of various channels for the disposal of natural resins in tribal areas. The analysis of producer share in consumer's rupee showed that lac growers, on average, had a share of 66.51 per cent in consumer price if they sold raw lac through wholesalers.

However, the most preferred channel in the study area, i.e. channel I, led producers to receive a comparatively lower share, i.e. 60.68 per cent in consumer rupee, due to the village merchant taking a share of net margin in the channel.

The degree of value addition on a product refers to its value's magnitude or percentage increase. Adding value can increase either the price or the value of a product. Fig. 2 depicts a detailed illustration of lac value chains in the selected districts of Jharkhand. It is observed from the figure that the degree of value addition in channel I begins at the village merchant stage, as lac growers did not add any value to the produce. The degree of value addition at the village merchant stage was 8.96 per cent as they performed aggregation of raw lac into bigger lots, handling, transportation, and loading/unloading operations, which added up to the value.

Table 5: Cost estimation along the lac value chain

Particulars	Channel I: Producer-Village Merchant-Wholesaler-Processor-Consumer		Channel II: Producer-Wholesaler-Processor-Consumer	
	Amount (₹/q)	Proportion (%)	Amount (₹/q)	Proportion (%)
Producer's selling price	75000		80000	
Marketing cost of producer	-	-	185.20	7.45
i) Transportation cost	-	-	173.20	93.52
ii) Loading & unloading Charges	-	-	12	6.48
Net price received by producer	75000		79814.80	
Village merchant purchase price	75000			
Marketing cost of village merchant	280	10.70	-	-
i) Transportation cost	204	72.86	-	-
ii) Loading & unloading Charges	56	20.0	-	-
iii) Handling Cost	20	7.14	-	-
Village merchant margin	6720			
Wholesaler purchase price	82000		80000	
Marketing cost of Wholesaler	650	24.85	642.10	25.84
i) Transportation cost	468	72.00	468	72.89
ii) Loading & unloading Charges	82	12.62	74.10	11.54
iii) Handling Cost	100	15.38	100	15.57
Wholesaler margin	12350		13357.90	
Processor purchase price	95000		94000	
Marketing cost of Processor	1685.65	64.44	1657.80	66.71
i) Processing charges	760	45.09	760	45.84
ii) Packaging charges	28.25	1.68	28.25	1.70
iii) Transportation cost	632	37.49	632	38.12
iv) Handling cost	130	7.71	110	6.64
v) Loading & unloading charges	90	5.34	86	5.19
vii)Miscellaneous charges	45.40	2.69	41.55	2.51
Processor margin	26914.35		24342.20	
Consumer purchase price	123600		120000	
Price spread	48600		40000	

Producer share in consumer rupee	60.68		66.51	
Marketing efficiency	1.54		1.99	

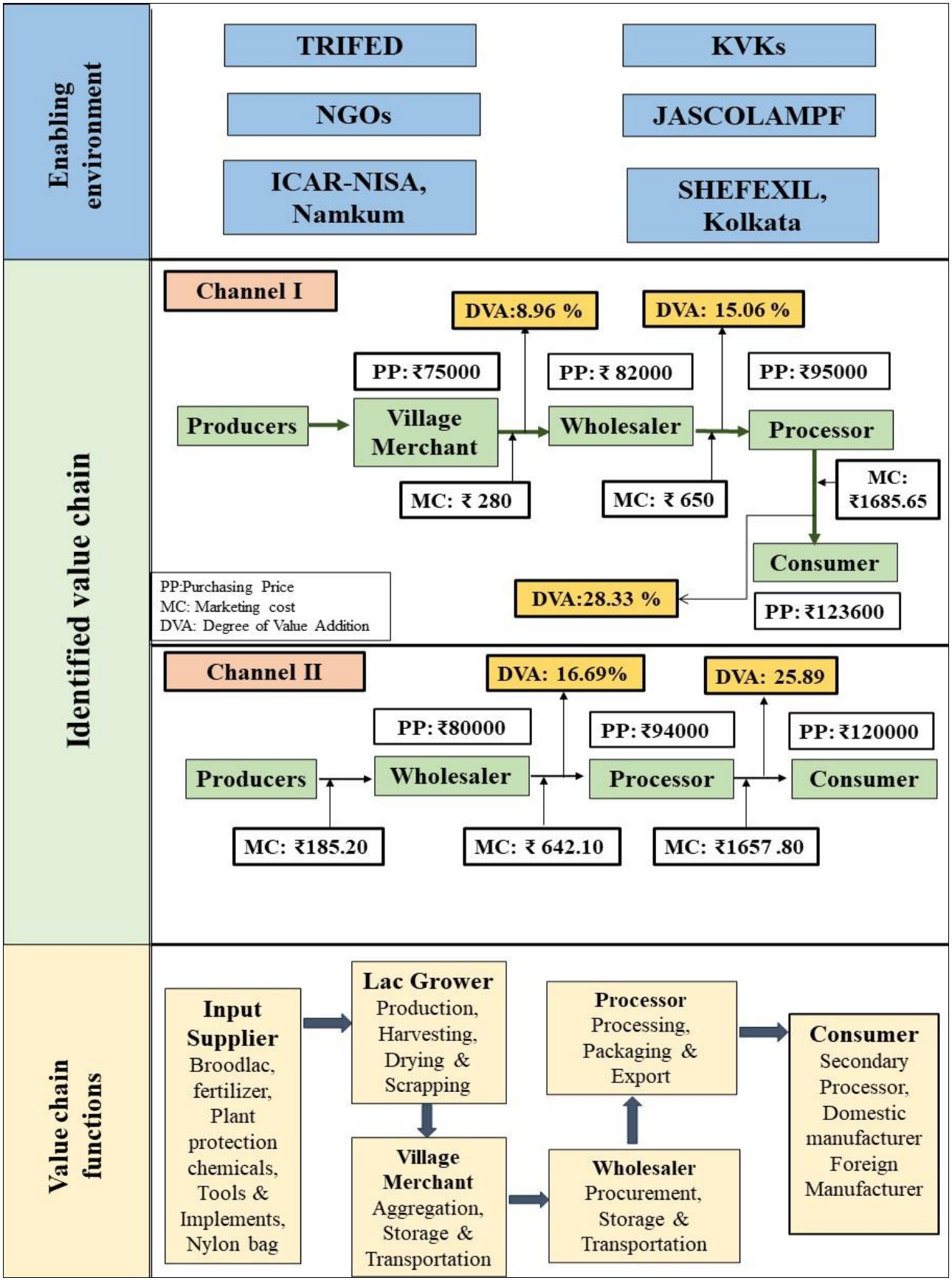

Fig 2: Comprehensive map of lac value chains in the study area

Wholesalers add 15.06 per cent of value by performing activities similar to village merchants, such as handling, transportation, and loading/unloading. The processor adds the most value in the value chain, around 28.33 per cent, by converting raw lac into seed lac and doing additional activities such as grading and storage, packaging, shipping, and loading/unloading. Channel II exhibited a 16.69 per cent value addition at the wholesaler stage, while the processor added 25.89 per cent. Despite a similar value addition in both the channels, the lac grower's income was observed with a significant divergence (₹75000 per quintal in channel I and ₹80000 per quintal in channel II).

Constraints perceived by the processors

The challenges addressed by the processors were also acknowledged. The studies demonstrated that the major hindrance faced by the lac processing industry is the price fluctuation of sticklac, which directly impacts the production level. The prices of lac have undergone a fairly wide and erratic trend over the past years. This was followed by the non-uniformity in the quality of the input material supplied. Due to the aggregation of lac in bigger lots, the quality gets reduced as it moves from farmer to *paikars*, wholesalers, and finally to the processing unit. As a result, processing units started importing sticklac from neighbouring countries. However, this has increased market competitiveness.

The processors are also concerned about the lack of a scientific procedure for determining the "*chouri parta*" content of sticklac. Other difficulties encountered by processing units in the study area include seasonal availability of raw lac and financial and infrastructural issues. Though the lac processing business has significant challenges, it cannot be ignored that a greater number of employments are generated throughout the value chain system. The global demand for eco-friendly, sustainable products provides a promising market for lac-based products. Lac producers in tribal belts can greatly boost their production and profitability by implementing scientific cultivation and processing techniques.

Conclusion

Agricultural value chains in India are extensively fragmented and intermediated, resulting in significant yield and quality losses, limited processing capacity, and high price volatility. Lac is a highly remunerative crop with a high potential for income generation. Therefore, the present study focused on the market dynamics of lac using strategic value chain mapping so as to develop a better understanding of the prospects of lac value chain and different interventions associated with it. Value chain analysis of lac suggests that in the lack of an organized marketing system for sticklac/scrapped lac, lac growers are obliged to sell the output at a very low price. At the same time, the intermediaries gain a high market margin. This highlights the importance of adding more action nodes to the existing value chain to protect the tribal lac growers from the clutches of intermediaries. This could be attained by enabling an organized marketing structure for lac and imparting awareness of various value chain activities through capacity-building programmes and demonstrations. Lac processing industries could be promoted of lac at the village level to increase the sustainable livelihood of rural and tribal people. Policymakers and researchers should promote forest-based livelihood-earning practices among tribal communities while aiming for the comprehensive development of value chains with a broad production basket. In addition, public and private organizations must shift their focus from production to post-production and processing frames.

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