

STUDY OF LAC PRODUCTION GROWTH IN JHARKHAND: DISTRICT-WISE AND CROP-WISE ANALYSIS

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Introduction

In Jharkhand, around 26 per cent population of the state is tribal. Out of the 24 districts of the state, 8 districts have been categorized as tribal districts (Anon., 2003). Jharkhand has 78 development blocks in which ST population is more than 50 per cent of total population. These blocks exist in the districts of Lohardaga, Garhwa, Palamau, Godda, Sahibganj, Pakur, Dumka, Ranchi, Gumla, West Singhbhum and East Singhbhum (Anon., 2008). The forest and sub-forest dwellers mainly depend on agriculture and forest produce for their livelihood and lac is an important source of income for these families. Lac cultivation also generates employment opportunities, particularly during off season of agriculture besides great demand in national and international market.

Jharkhand state alone has contributed around 60 per cent of lac production of the country, which is now reduced to around 40 per cent. Since last few years, the Jharkhand state has witnessed '*rangeeni*' crop failure in several districts due to one or other reasons. Earlier, the '*rangeeni*' lac production area used to have hectic activity arising out of crop harvesting from April to June but it is not so much nowadays. The commercial '*baisakhi*' crop is known to few only.

A survey of Ranchi district revealed that 28 per cent of the total agriculture income is contributed by lac in this region (Jaiswal *et al.*, 2006). The study by Jaiswal *et al.* (2006) showed that '*palas*' is the largest source of income in Ranchi district of Jharkhand which accounted for around 47 per cent followed by '*kusum*' (32 per cent) and '*ber*' (21 per cent). The production from these commercial crops largely depends on preceding '*rangeeni*'-rainy and '*kusmi*'-summer crop (Jaiswal and Saha, 1993). In order to understand the scenario and identify the threat (e.g. crop, season and districts) which affect the overall production in Jharkhand, crop-wise and district-wise data of last four years have been analyzed to draw a conclusion for making any development strategy.

Material and Methods

The district-wise and crop-wise secondary data on lac production, from 2006-07 to 2009-10 have been collected from published information (Pal *et al.*, 2007, 2008, 2009, 2010). Minimum, maximum, mean values

and growth rate (simple) were considered as standard parameters for each district and crop wise simple growth rate (SGR) of lac production have been calculated by using the formula ($SGR = \frac{b}{y} \times 100$) as given by Pandey and Guglani (1990) where *b* is the regression co-efficient over time and *y* is the average production during the period. A comparison of growth rate in three years period (2006-07 to 2008-09) with those in four years data (2006-07 to 2009-10) has also been made for understanding the status of change in production.

Result and Discussion

A perusal of data (Table 1) indicated that Jharkhand state contributes 39.3 per cent of country's lac production. Highest production was recorded in Ranchi district followed by Simdega, Gumla, West Singhbhum, Palamau, Garhwa and Latehar. Simdega which contributes 24.5 per cent of total lac production of the state as well as Gumla and West Singhbhum districts which together accounts 31.1 per cent. It also showed a positive growth rate of 28.9, 21.6 and 17.3 per cent per annum during the period 2006-07 to 2009-10. These three districts together contribute 55.6 per cent of state's production and recorded positive growth during last four years. Ranchi, Palamau, Garhwa and Latehar recorded negative growth rate during last four years. The state recorded negative growth of 8.2 per cent per annum against a negative growth of 15.3 per cent recorded at national level.

A comparison of growth rate during last three years (2006-07 to 2008-09) and four years (2006-07 to 2009-10) revealed that two districts West Singhbhum and Simdega which recorded negative growth of 17.3 and 21.2 per cent respectively changed to positive growth during last four years and recorded 6.32 and 28.9 per cent growth per annum. Except in Ranchi district three other districts Latehar, Palamau and Garhwa negative growth rate increased during last four years in comparison to three years (Table 1). However, in Ranchi negative growth rate still persists but its magnitude was lower during last year indicating improvement in lac production. During three years period the overall growth rate was -39.1 per cent but during four years period it was recorded -8.2 per cent indicating improvement in lac production over the years.

Crop-wise production of lac and growth rate has been presented in Table 2. This shows that '*kusmi*' lac production in Gumla, West Singhbhum and Simdega districts were good and growth rates recorded 28.7, 13.5 and 36.6 per cent per annum respectively. While, the production of '*rangeeni*' crop in the same districts was not up to the mark and showed negative growth rate which were 39.1, 29.6 and 48.4 per cent per annum respectively. Both summer and rainy season crop recorded negative growth for these districts and magnitude was higher for rainy season than summer season crop. It recorded -45, -40 and -51.1 per cent growth for rainy season against -25.7, -14.6 and -43.8 per cent per annum for summer season crop respectively. In case of '*kusmi*', the summer crop showed positive growth for all these three districts to the tune of 46.8, 43.0 and 67.1 per cent per annum for Gumla, West Singhbhum and Simdega districts. For '*kusmi*' winter crops, Gumla district showed only 1.3 per cent growth rate and hence may be considered as stable but it recorded -29.1 per cent for West Singhbhum and -6.7 per cent for Simdega district. Despite negative growth rate of '*kusmi*' lac production in Ranchi district, the '*kusmi*'-summer crop did well and registered a positive growth of 10.4 per cent per annum.

The overall positive growth of '*kusmi*'-summer crop in the state (47.1 per cent) and in all '*kusmi*' lac growing regions of the state (19.4 per cent) may be due to the suitability of climate in the areas. These areas are found to be blessed with a plenty of '*kusum*' trees and summer crop is recommended on these trees. The positive growth in '*kusmi*' production is also possible that due to a paradigm shift in technology of '*kusmi*' lac cultivation from '*kusum*' to '*ber*' (*Ziziphus mauritiana*), which resulted into availability of sufficient quantity of broodlac in the month of January-February inviting farmers to inoculate more trees. Field observations indicate that '*kusmi*' lac cultivation technology on *ber* trees developed by Indian Institute of Natural Resins and Gums (IINRG), Ranchi has been adopted in many parts of Jharkhand, including the '*kusmi*' belts. It covers large number of '*kusum*' tree as the broodlac derived from *ber* trees are of good quality. The winter crop output do not reflect in growth rate because these were mainly utilized in the form of broodlac and scraped broodlac marketing took at least 2-3 months after winter harvesting.

Latehar, Palamau and Garhwa are '*rangeeni*' lac production areas of Jharkhand and blessed with plenty number of *palas* and *ber* trees. The negative growth rate was higher for rainy season crop in Palamau and Garhwa than summer. Similar situation was recorded in Ranchi district, but in Latehar, summer crop showed higher value. Normally, commercial '*rangeeni*' crop is called

baisakhi ari which is harvested in the month of April from *palas* and in May from *ber*, this is mainly because of the cash need of money by the poor farmers. It is marketed immediately and thus reaches to processing unit in the month of May last to June. Any impact of higher temperature during summer season would reflect output from rainy season crop because it will have direct effect on lac culture on host tree which was left on tree itself in the form of broodlac. The high rate of '*rangeeni*'-summer crop mortality in these areas was due to relatively high temperature and lack of any intermittent rain during summer. The other factors like high pre-summer mortality also affect the production in recent times. The '*rangeeni*'-summer crop which is raised in October and mature in June-July suffer high mortality during the past 4-5 years. The pre-summer mortality normally take place in February-March and high temperature mortality sometimes in May. Besides, late monsoon during the last two years is also responsible for reduction in lac crop production. The impact of pre-summer mortality reflects directly on output from summer crop but pre-summer, summer mortality and effect of late monsoon affect output from rainy season crop. It is also dependent on magnitude of lac insect survived at the time of crop maturity in June-July. The farmers do not harvest broodlac in June-July but leave them on tree for multiplication as per recommended practice. There is need to address these three important problems, the '*rangeeni*' lac faces. The selection of suitable insect and host biotype which can tolerate high temperature and drought condition or supplementing some new host species which may stay green during summer season, may help to minimize the problems to a large extent. A study of Jaiswal *et al.*, (2003) has also reported that summer mortality of *palas* lac crop has been a major problem in Jharkhand. It was suggested to practice cultivation on non-conventional lac-host trees like *Ficus* spp. (Jaiswal *et al.*, 2001) as these act as a summer broodlac preserver in view of its evergreen nature.

Conclusion

Jharkhand is the second largest lac producing state of the country after Chhattisgarh. Although in last four years, the state recorded an overall negative growth of 8.2 per cent per annum while, during last three years, state recorded negative growth of 39.1 per cent per annum. The main reason for reduction in lac production in the state are '*rangeeni*' lac crop (-54.5 per cent growth) with negative growth in both the crops *i.e.* '*rangeeni*' summer crop (-45.6 per cent) and '*rangeeni*' rainy crop (-60.7 per cent). Severely affected districts are Latehar, Palamau, Garhwa and Ranchi with negative growth (-69.3, -44.7, -43.3 and -42.8 per cent per annum

Table 1*District wise lac production (tons) and growth rate (period 2006-07 to 2009-10).*

Sl. no.	District/State	Minimum	Maximum	Mean	Per cent share	Simple growth rate (2006-07 to 2009-10)	Simple growth rate (2006-07 to 2008-09)
1.	Ranchi	875	2900	1736.3	28.5	-42.8	-50.1
2.	Gumla	650	1435	1090.0	17.9	+21.6	+24.9
3.	West Singhbhum	570	1060	807.5	13.2	+6.32	-17.3
4.	Simdega	750	3145	1492.5	24.5	+28.9	-21.2
5.	Latehar	20	370	177.5	2.9	-69.3	-65.2
6.	Palamau	150	700	425.0	6.9	-44.7	-38.7
7.	Garhwa	65	300	201.3	3.3	-43.0	-32.4
8.	Other districts	160	200	170.0	2.8	-7.1	-15.4
	Jharkhand	4000	7490	6100	100	-8.2	-39.1
					(39.3)*		
	India	16,495	23,229	15,508	-	-15.3	-

*Figures in parentheses indicate contribution (%) by the state in country's production.

Table 2*Crop wise production of lac (in tons) and growth rate (period 2006-07 to 2009-10).*

District	Parameters	Rangeeni			Kusmi		
		Summer crop	Rainy crop	Total	Summer crop	Winter crop	Total
Ranchi	Minimum	75.0	15.0	90.0	200.0	250.0	550.0
	Maximum	700.0	1200.0	1800.0	550.0	700.0	1100.0
	Mean	375.0	528.8	903.8	357.5	475.0	832.5
	Growth rate	-57.3	-76.7	-68.7	10.4	-33.7	-14.8
Gumla	Minimum	25.0	10.0	35.0	200.0	300.0	500.0
	Maximum	50.0	150.0	190.0	1100.0	500.0	1400.0
	Mean	35.0	80.0	115.0	587.5	387.5	975
	Growth rate	-25.7	-45.0	-39.1	46.8	1.3	28.7
W. Singhbhum	Minimum	40.0	20.0	60.0	150.0	100.0	450.0
	Maximum	90.0	120.0	190.0	900.0	350.0	1000.0
	Mean	55.0	80.0	135.0	397.5	275.0	672.5
	Growth rate	-14.6	-40.0	-29.6	43.0	-29.1	13.5
Simdega	Minimum	30.0	15.0	45.0	250.0	400.0	650.0
	Maximum	100.0	150.0	250.0	2400.0	800.0	3100.0
	Mean	52.5	90.0	142.5	850.0	600.0	1450.0
	Growth rate	-43.8	-51.1	-48.4	67.1	-6.7	36.6
Latehar	Minimum	10.0	10.0	20.0	-	-	-
	Maximum	170.0	200.0	370.0	-	-	-
	Mean	75.0	102.5	177.5	-	-	-
	Growth rate	-74.7	-65.4	-69.3	-	-	-
Palamau	Minimum	100.0	25.0	150.0	-	-	-
	Maximum	300.0	400.0	700.0	-	-	-
	Mean	193.8	231.3	425.0	-	-	-
	Growth rate	-34.8.0	-53.0	-44.7	-	-	-
Garhwa	Minimum	40.0	25.0	65.0	-	-	-
	Maximum	100.0	200.0	300.0	-	-	-
	Mean	70.0	131.3	201.3	-	-	-
	Growth rate	-34.3	-47.6	-43.0	-	-	-
Other districts	Minimum	20.0	20.0	60.0	40.0	40.0	80.0
	Maximum	50.0	50.0	100.0	50.0	50.0	100.0
	Mean	37.5	40.0	77.5	45.0	47.5	92.5
	Growth rate	-13.3	-20.0	-16.8	0.0	2.1	1.1
Jharkhand	Minimum	385.0	140.0	525.0	1190.0	1400.0	2790.0
	Maximum	1420.0	2420.0	3840.0	5000.0	2200.0	6400.0
	Mean	893.8	1283.8	2177.5	2237.5	1785	4022.5
	Growth rate	-45.6	-60.7	-54.5	47.1	-15.4	19.4

respectively). The factors resulting in improvement may be attributed to adoption of scientific method of lac cultivation by farmers as recommended by Indian Institute of Natural Resins and Gums (IINRG), still severe loss of 'rangeeni' crop draws attention towards need of

more research and selection of suitable heat tolerant insect and host biotype. Besides, it is also suggested to establish 'rangeeni' broodlac farm at suitable places (big patches of host plant and suitable climate) so that its shortage may be minimized.

Summary

Status of lac production in lac growing districts of Jharkhand has been assessed with parameters like minimum, maximum, average production and simple growth rate for the period 2006-07 to 2009-10. A comparison of growth rate in three years period (2006-07 to 2008-09) with those in four years period (2006-07 to 2009-10) has also been made for understanding the status of change in production. The analysis of data showed that Ranchi district has highest production of lac to the tune of 28.9 per cent of total lac production of the state followed by Simdega (24.5 per cent) and Gumla (17.9 per cent). The positive growth rate in lac production was recorded in Gumla, West Singhbhum and Simdega to the tune of 21.6, 6.32 and 28.9 per cent per annum respectively during last four years. Highest negative growth rate was recorded in Latehar (-69.3 per cent) district. Comparative analysis of last three and four years period growth rate showed that Gumla district recorded positive growth with slight reduction (24.9 to 21.6 per cent). Simdega district reported very good improvement (-21.2 to 28.9 per cent) and another district which recorded good improvement was West Singhbhum (-17.3 to 6.3 per cent).

Key words: Lac production, Growth rate, Jharkhand, 'Rangeeni' lac and 'Kusm' lac.

झारखण्ड में लाख-उत्पादन वृद्धि का अध्ययन: उसका जिलेवार और फसलवार विश्लेषण

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सारांश

झारखण्ड के लाख उत्पादक जिलों की लाख उत्पादन स्थिति का अध्ययन ऐसे परिमाण, जैसे न्यूनतम, अधिकतम, औसत उत्पादन तथा 2006-2007 से 2009-10 की अवधि के दौरान सामान्य बढ़वार की दर अपनाकर आकलित किया गया है। तीन वर्षों (2006-07 से 2008-09) के दौरान रही वृद्धि दर की तुलना चार वर्षों (2006-07 से 2009-10) की वृद्धि दर से भी गई है ताकि उत्पादन में हुए परिवर्तन को समझा जा सके। आंकड़ों के विश्लेषण ने दिखाया कि रांची जिले का लाख उत्पादन अधिकतम यानी राज्य के कुल उत्पादन का 28.9 प्रतिशत है जिसके बाद सिमडेगा (24.5%) और गुमला (17.9%) आते हैं। लाख उत्पादन में होती बढ़वार की दर सकारात्मक रहती गुमला, पश्चिमी सिंह भूम और सिमडेगा में क्रमशः 21.6, 6.32 और 28.9% वार्षिक पिछले चार वर्षों में रहती देखी गई। अधिकतम नकारात्मक वृद्धि लाटेहार (-69.3%) जिले में होती पाई गई। पिछली तीन वर्षीय और चार वर्षीय अवधियों में हुई बढ़वार की दरों के तुलनात्मक विश्लेषण ने दिखाया कि गुमना जिले में सकारात्मक वृद्धि दर अधिकतम आलेखित हुई जिसमें मामूली सी घटत हुई (24.9 से 21.6%), सिमडेगा जिले से बहुत अच्छा सुधार इसमें होता पाया गया (-21.2 से 28.9%) तथा एक अन्य जिसमें अच्छा परिणाम होता दिखाई पड़ा वह है पश्चिम सिंह भूम (-17.3 से 6.3%)।

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