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SOCIO-ECONOMIC CHARACTERISTICS OF LAC GROWERS AND HOST TREES UTILIZATION PATTERN: A COMPARATIVE STUDY

Yogi, R. K. and Jaiswal, A. K.

ABSTRACT

India is the largest lac producing country in the world. Jharkhand and Chhattisgarh state jointly contributing more than 70% of total lac produced in the country. The present study was carried out with a view to examine the utilization pattern of lac host trees across different categories of households and its policy implication. The study is based on primary data for the agriculture year 2012-13 and collected from 200 farmers from Bastar, Dantewada and Rajnandgoan (Chhattisgarh) Jamtara, Khunti, Ranchi, and Saraikela Kharsawan districts (Jharkhand). The data were analyzed category wise, based on land holding size by using tabular analysis and percentage. Average number of lac host trees per households across various categories varied from 43 to 84 while the number of lac host trees utilized ranged from 16 to 45 among various categories of households. It was observed that 48-51% households owned *palas* (*Butea monosperma*) trees, 41-78% *ber* (*Ziziphus mauritiana*) and only 29-33% owned *kusum* tree (*Schleichera oleosa*) and overall 72-80% of sampled household owned effective host trees (under lac cultivation) either of *palas*, *ber* or *kusum*. About 20 to 28% of sampled households were possessed host trees but were not involved in lac cultivation. They are required to be targeted for motivational training programmes. About 35 to 59% households are using less than 50% of the available host trees. They may be provided technical guidance to utilize more proportion of host trees for lac cultivation. A big potential in this sector can be harnessed for generating gainful employment and livelihood security of the poor households at micro level and earning of foreign exchange at macro level.

Key words: Effective host trees, family size, lac cultivation, land holding size literacy,

INTRODUCTION

Lac is a natural, renewable, bio-degradable, versatile and non-toxic resin produced by the colonies of a tiny insect known as *Kerria lacca* (Kerr). India is the largest lac producing country in the world and Jharkhand and Chhattisgarh state jointly contributes more than 70% of total lac produced in the nation. Lac cultivation in parts of Jharkhand, West Bengal, Madhya Pradesh, Chhattisgarh, Maharashtra, Andhra Pradesh and other states in India is the source of

livelihood for majority of tribal farmers and contributing 20-30% of the grower's annual income (Pal *et al.*, 2012). About more than 50% tribals of *gaddis* community in Himachal Pradesh have knowledge of extracting minor forest product (MFP), about 25% of their income generated from the collection of MFP while 48% from agricultural and remaining 27% from the other sources (Sharma & Butola, 2008). In the remote villages, most of the lac host trees are either on wasteland or bunds of fields which hardly interfere with other

agricultural operations. The most common host trees for lac cultivation are *Butea monosperma* (Palas), *Ziziphus mauritiana* (Ber), and *Schleichera oleosa* (Kusum), besides several trees of regional importance (Roonwal *et al.*, 1958, Varshney & Teotia, 1967 and Sharma *et al.*, 1997). Involvement in lac cultivation on palas and ber were almost same but percentage of the trees utilized by farmers with marginal land holding was relatively higher than those with large land holdings (Jaiswal *et al.*, 2006). Marginal farmers are more inclined towards lac cultivation for livelihood security (Yogi *et al.*, 2014). Jharkhand state registered highest average annual production (6306 tonnes), sharing 38.82% of total lac produced in the country (Annual Report, 2013-14, IINRG). In view of this scenario, present investigation was conducted to identify the resource endowment and utilization pattern of lac host trees in the field conditions.

MATERIAL AND METHODS

The study is based on primary data for the agriculture year 2012-13 and collected from 200 farmers from Bastar, Dantewada and Rajnandgoan (Chhattisgarh), Jamtara, Khunti, Ranchi, and Saraikela Kharsawan districts (Jharkhand). Information on socio-economic background, utilization pattern of lac host trees across various categories of households were collected from the respondents on pre tested interview schedules. The households have been classified based on land holding sizes as marginal (<2.5 acre), small (2.5-<5 acre), semi medium (5-<10 acre) and medium and large (10-<25 acre) categories. In the state of Jharkhand the average land holding

size is lower than national averages and very few respondents belonged to large category. Hence, medium and large group clubbed together. The data were analyzed category wise, based on land holding size by using tabular analysis.

RESULTS AND DISCUSSION

Average number of lac host trees per households varied from 43 to 84 while the number of utilized lac host trees ranged from 9 to 45 among various categories of households. Socio-economic background of the sampled households is presented in Figure 1 and Table 1.

In Jharkhand, the highest number of households belonged to the marginal (44%) category followed by semi medium (23%), small (20%), medium and large (13%) categories of households. Average family size across the all household categories varied from about 6 to 7 members. Family size was lowest at marginal category and it decreases as the land holding increases from 2.5 to 25 acre. This may be happened due to the fact that as holding size decreases from the marginal level of 2.5 acre, the structure of family changes to nuclear family and as the land holding size increases from 2.5 to 25 acre, the average family size declined from 7.1 to 6.23. Educational level in terms of the schooling years was higher in case of small and semi-medium categories of households. Literacy rate was observed highest in case of marginal and small (90%) category households followed by medium and large (70-75%) categories of households. Overall, the averages family size was observed 6.34. About 84% lac growers were found literate. Out of them, about 70% reached up to matriculation, 13% crossed this

standard and only 1% could afford for college level education.

Similarly, in Chhattisgarh the highest number of households belonged to the small (42%) category followed by marginal (30%), semi medium (15%), medium and large (13%) categories of households. Average family size across the all household categories varied from about 5 to 6 members. Family size was lowest at marginal category and it varies from 5 to 6 as the land holding changes 2.5 to 25 acre. Educational level was higher in case of medium and large categories of households. Literacy rate was observed highest in case of medium and large (100%) category households followed by small (98%), marginal and semi medium (93%) categories of households. Overall, the averages family size was observed 5.6 and 96% lac growers were found literate. Out of them, about 60% respondents completed matriculation, 16% crossed this standard and 22% could afford for college level education.

Thus, majority of households (72%) in Chhattisgarh endowed with the limited resources, but the family size of these categories of households was found comparatively lower than of that was observed in Jharkhand. Majority of households (64%) in Jharkhand endowed with the limited resources and have to manage the livelihood for a big family. Education level was found higher in case of small and semi-medium categories in Jharkhand. Higher education level was observed for medium and large categories of households in Chhattisgarh. They could afford for college level education. Literacy level of lac growers was found comparatively higher in Chhattisgarh.

Inventory of lac host trees and availability for lac cultivation across various categories of households is presented in Figure 2 and Table 2. In Jharkhand, lac growers possessed an average of 5 *kusum*, 17 *ber* and 36 *palas* host trees. Similar ratio of average holdings of host trees availability was observed in the study conducted in Jharkahnd (Jaiswal *et al.*, 2006 a). More host trees of *kusum* and *palas* were found with the lac growers in Chhattisgarh. In both the states, semi-medium category households could be the potential lac growers as they were endowed with the more host trees in comparison to the other household categories.

In Jharkhand, effective host trees of *kusum*, *ber* and *palas* were observed about 4, 10 and 22 host trees, respectively. Number of effective host tress with the households in Chhattisgarh was observed lower than Jharkhand. It is evident from the Table 2 that overall number of host trees with lac growers was 36 and 16 in Jharkhand and Chhattisgarh, respectively. In Chhattisgarh, the number of effective host tress was found declining with the increase of land holding size. As the holding size increase, farmer engages in other agricultural activities and could not go for the supplementary source of income.

A perusal of Table 3 about effective host trees (*B. monosperma*) for lac cultivation showed that the highest proportion was among the medium and large category households in both of the states. Overall, about 90% households from Jharkhand and 79% of households from Chhattisgarh were endowed with the *palas* tress as effective host trees. Highest proportion of host utilization

was observed in case of marginal (79%) and medium-large (64%) category households from Jharkhand and small (38%) and semi-medium (29%) category households from Chhattisgarh. In Jharkhand, about 90% households were found owing the *palas* host tress with them but only 51% were engaged in lac cultivation on *palas*. Out of these 51% households, about 53% were found to utilize the full potential of available host trees and 27% were utilizing more than 50% host trees for lac cultivation. Similarly, in Chhattisgarh, about 79% were found owing the *palas* host tress with them but only 48% were engaged in lac cultivation on *palas*. Out of these 48% households, only 33% were found to utilize the full potential of available host trees and 15% were utilizing more than 50% host trees for lac cultivation.

The proportion of effective host trees of *Z. mauritiana* for lac cultivation is depicted in Table 4. Among all categories, small category households were found with highest proportion of effective host trees in both the states. Overall, about 78% households from Jharkhand and 41% households from Chhattisgarh were endowed with the *ber* tress as effective host trees. Highest proportion of host utilization was observed in case of medium-large (80%) and marginal (56%) category households from Jharkhand and marginal (58%) and small (48%) category households from Chhattisgarh. In Jharkhand, about 78% were found owing the *ber* host tress with them but only 78% were engaged in lac cultivation on *ber*. Out of these 78% households, about 50% were found to utilize the 100% potential of available host trees and 32% were utilizing more than 50% host trees for lac cultivation. Similarly, in Chhattisgarh, about 80%

were found owing the *ber* host tress with them but only 41% were engaged in lac cultivation on *ber*. Out of these 41% households, only 46% were found to utilize the full potential of available host trees and 24% were utilizing more than 50% host trees for lac cultivation.

In case of *S. oleosa*, the proportions of effective host trees for lac cultivation were found highest among the medium large and semi-medium categories households in the states of Jharkhand and Chhattisgarh, respectively. Overall, about 29% households were endowed with the *kusum* tress as effective host trees in both of the states. Highest proportion of host utilization was observed in case of medium-large (75%) and marginal (67%) category households from Jharkhand and marginal (71%), small and semi-medium (50%) category households from Chhattisgarh. In Jharkhand, about 58 % were found owing the *ber* host tress with them but only 29% were engaged in lac cultivation on *kusum*. Out of these 29% households, about 59% were used all of the available host trees and 31% were utilized more than 50 % host trees for lac cultivation. Similarly, in Chhattisgarh, about 64 % were found owing the *kusum* host tress with them but only 29% were engaged in lac cultivation on *kusum*. Out of these 29% households, only 54% were found to utilize the full potential of available host trees and 14% were utilizing more than 50% host trees for lac cultivation (Table 5).

Overall, host utilization pattern is showed in Figure 3. The proportions of effective host trees for lac cultivation were found highest among the small category in Jharkhand and semi-medium category in Chhattisgarh. Medium- large category households

were also having more than 80% effective host trees in both of the states. Overall, about 80% households were endowed with the effective host trees in Jharkhand and 72% households in the states of Chhattisgarh were possessed host trees either on *kusum*, *ber* or *palas* for lac cultivation. Highest proportion of host utilization was observed in case of medium-large (64%) and marginal (46%) category households from Jharkhand and marginal (29%) and small (27%) category households from Chhattisgarh. In Jharkhand, all household were found owing the host trees with them but only 80% were engaged in lac cultivation. Out of these 80% households, about 34% were found to utilize the full potential of available host trees and 31% were utilizing more than 50% host trees for lac cultivation. Similarly, in Chhattisgarh, about 99% of sampled households were found owing the host trees with them but only 72% were engaged in lac cultivation. Out of these 72% households, only 20% were found to utilize the full potential of available host trees and 20% were utilizing more than 50% host trees for lac cultivation.

Poor utilization (< 50%) of effective host trees was found across 35% households in Jharkhand and 59% households in Chhattisgarh. In Jharkhand, it was observed that host trees utilized for lac cultivation across all the categories of households was relatively higher for *ber* (78%) than that of corresponding figure in case of *palas* (51%) and *kusum* (29%). As quality and quantity of lac produced on *ber* is better and higher than *palas* and thus it fetch the higher price. Hence, this may be possible reason to utilize more proportion of the available *ber* trees in comparison to other host trees. However, in Chhattisgarh, it was

observed that in each category households utilizing trees for lac cultivation was relatively higher for *palas* (48%) than that of corresponding figure in case of *ber* (41%) and *kusum* (29%). Promotion of *kusmi* lac cultivation by supplying quality broodlac could be a good strategy to increase the utilization pattern of existing host trees in the state. Higher benefit cost ratio and reduction in cost of production of broodlac and sticklac by adopting scientific lac cultivation practices could motivate lac-growers for lac cultivation on all the three hosts of lac (Pal, 2009).

CONCLUSION AND POLICY IMPLICATIONS

There is great scope for further enhancement in the lac cultivation in Jharkhand. Lac growers particularly marginal, medium and large farmers engaged in lac cultivation may be supported thorough various government schemes as they utilize the available host trees better than the other category households. Across various categories about 20% households have not involved in lac cultivation are required to be targeted for motivational training programmes and 35% households who are using less than 50% of the available host trees may be provided technical guidance to utilize more proportion of host trees for lac cultivation.

Similarly, in Chhattisgarh, lac growers' particularly marginal and small categories of households were observed to utilize the available host trees better than the other category households. They may be supported thorough various government schemes. About 28% of sampled households were not involved in lac cultivation. They are needed to be targeted for motivational

training programmes. About 59% households were using less than 50% of the available host trees. They may be provided technical guidance to utilize more proportion of host trees for lac cultivation.

Majority of households endowed with the limited resources and have to manage the livelihood for a larger family. However, family size was found inversely related to the land holding size, but as holding size decreases from the marginal level of 2.5 acre, the structure of joint family changes to nuclear family and family size was relatively smaller than other categories of households. Proportion of host tree utilized for lac cultivation influenced by various socio-economic factors but, magnitude of the number of host trees utilized by lac farmers was not influenced much by the different socio-economic factors. Educational level in terms of the schooling years was higher in case of small and semi-medium categories of households and the overall utilization of the host trees was lower in case of these categories. Both these categories required to be targeted under various awareness and motivational programmes for lac cultivation. Technical guidance may be provided to utilize more proportion of the host trees for lac cultivation. Utilizing full potential of available host trees for lac cultivation with recommended technologies will enhance the income level and by thus standard of living of the farmers.

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Table 1: Education level of households across various categories (in %)

Category of Households (Land holding size in acres)	Jharkhand					Chhattisgarh				
	Illiterate	Literate@				Illiterate	Literate@			
		1-5	6-10	11-12	>12		1-5	6-10	11-12	>12
Marginal (<2.5)	9.08 (4)	29.55 (13)	54.55 (24)	6.82 (3)	0.00 (0)	6.67 (2)	30.00 (9)	36.67 (11)	13.33 (4)	13.33 (4)
Small (2.5-<5)	10.00 (2)	10.00 (2)	60.00 (12)	20.00 (4)	0.00 (0)	2.38 (1)	26.19 (11)	38.10 (16)	11.90 (5)	21.43 (9)
Semi-Medium (5-<10)	30.43 (7)	13.04 (3)	30.44 (7)	26.09 (6)	0.00 (0)	6.67 (1)	6.67 (1)	46.67 (7)	26.67 (4)	13.33 (2)
Medium +Large (10-25)	23.08 (3)	23.08 (3)	46.15 (6)	0.00 (0)	7.69 (1)	0.00 (0)	0.00 (0)	23.08 (3)	23.08 (3)	53.85 (7)
Overall	16.00 (16)	21.00 (21)	49.00 (49)	13.00 (13)	1.00 (1)	4.00 (4)	21.00 (21)	37.00 (37)	16.00 (16)	22.00 (22)

@ Education in number of schooling years, Figure in parentheses indicates the number of households

Table 2: Effective host trees for lac cultivation across various categories of households

Category of households	Jharkhand				Chhattisgarh			
	Kusum	Ber	Palas	Total	Kusum	Ber	Palas	Total
Marginal(<2.5)	1 (100)	7 (58)	25 (83)	33 (77)	2 (25)	2 (18)	14 (40)	18 (33)
Small (2.5-<5)	1 (50)	12 (57)	21 (55)	34 (55)	3 (27)	3 (33)	10 (21)	16 (24)
Semi-Medium(5-<10)	2 (67)	13 (52)	23 (43)	38 (46)	3 (12)	3 (20)	11 (25)	17 (20)
Medium +Large (10-25)	22 (96)	8 (53)	15 (75)	45 (78)	1 (7)	2 (22)	6 (21)	9 (17)
Overall	4 (80)	10 (59)	22 (61)	36 (62)	2 (15)	3 (27)	11 (28)	16 (25)

Figure in parentheses indicates percentage of host trees used for lac cultivation

Table 3: Utilization pattern of *B. mono sperma* (*palas*) as lac host trees across various categories

Particulars	Jharkhand					Chhattisgarh				
	Marginal	Small	Semi-Medium	Medium + Large	Total	Marginal	Small	Semi-Medium	Medium +Large	Total
No. of households	44	20	23	13	100	30	42	15	13	100
Household with host trees	86.36 (38)	85.00 (17)	95.65 (22)	100.00 (13)	90.00 (90)	73.33 (22)	80.95 (34)	73.33 (11)	92.31 (12)	79.00 (79)
Household involved in lac cultivation	43.18 (19)	50.00 (10)	47.83 (11)	84.62 (11)	51.00 (51)	40.00 (12)	50.00 (21)	46.67 (7)	61.54 (8)	48.00 (48)
Utilization Pattern (in %)										
100	78.95 (15)	30.00 (3)	18.18 (2)	63.64 (7)	52.94 (27)	0.00 (6)	38.10 (8)	28.57 (2)	0.00 (0)	33.33 (16)
75-99	5.26 (1)	10.00 (1)	9.09 (1)	18.18 (2)	9.80 (5)	0.00 (0)	4.76 (1)	0.00 (0)	12.50 (1)	4.17 (2)
50-74	10.53 (2)	40.00 (4)	27.27 (3)	0.00 (0)	17.65 (9)	0.00 (0)	9.52 (2)	14.29 (1)	25.00 (2)	10.42 (5)
1-49	5.26 (1)	20.00 (2)	45.45 (5)	18.18 (2)	19.61 (10)	50.00 (6)	47.62 (10)	57.14 (4)	62.50 (5)	52.08 (25)

Figure in parentheses indicates the number of households

Table 4: Utilization pattern of *Z. mauritia na* (*ber*) as lac host trees across various categories

Particulars	Jharkhand					Chhattisgarh				
	Marginal	Small	Semi-Medium	Medium +Large	Total	Marginal	Small	Semi-Medium	Medium +Large	Total
No. of households	44	20	23	13	100	30	42	15	13	100
Household with host trees	97.73 (43)	95.00 (19)	100.00 (23)	100.00 (13)	98.00 (98)	90.00 (27)	92.86 (39)	93.33 (14)	69.23 (9)	80.00 (80)
Household in lac cultivation	77.27 (34)	95.00 (19)	65.22 (15)	76.92 (10)	78.00 (78)	40.00 (12)	50.00 (21)	26.67 (4)	30.77 (4)	41.00 (41)
Utilization Pattern (in %)										
100	55.88 (19)	26.32 (5)	46.67 (7)	80.00 (8)	50.00 (39)	58.33 (7)	47.62 (10)	25.00 (1)	25.00 (1)	46.34 (19)
75-99	11.76 (4)	5.26 (1)	0.00 (0)	10.00 (1)	7.69 (6)	0.00 (0)	4.76 (1)	0.00 (0)	0.00 (0)	2.44 (1)
50-74	17.65 (6)	31.58 (6)	46.67 (7)	0.00 (0)	24.36 (19)	25.00 (3)	14.29 (3)	50.00 (2)	25.00 (1)	21.95 (9)
1-49	14.71 (5)	36.84 (7)	6.67 (1)	10.00 (1)	17.95 (14)	16.67 (2)	33.33 (7)	25.00 (1)	50.00 (2)	29.27 (12)

Figure in parentheses indicates the number of households

Table 5: Utilization pattern of *S. oleosa* (*kusum*) as lac host trees across various categories of households

Particulars	Jharkhand					Chhattisgarh				
	Marginal	Small	Semi-Medium	Medium +Large	Total	Marginal	Small	Semi-Medium	Medium +Large	Total
No. of households	44	20	23	13	100	30	42	15	13	100
Household with host trees	43.18 (19)	55.00 (11)	78.26 (18)	76.92 (10)	58.00 (58)	73.33 (22)	59.52 (25)	60.00 (9)	61.54 (8)	64.00 (64)
Household involved in lac cultivation	20.45 (9)	25.00 (5)	30.43 (7)	61.54 (8)	29.00 (29)	23.33 (7)	30.95 (13)	40.00 (6)	23.08 (3)	29.00 (29)
Utilization Pattern (in %)										
100	66.67 (6)	20.00 (1)	57.14 (4)	75.00 (6)	58.62 (17)	71.42 (5)	50.00 (6)	50.00 (3)	33.33 (1)	53.57 (15)
75-99	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	8.33 (1)	0.00 (0)	0.00 (0)	3.57 (1)
50-74	33.33 (3)	40.00 (2)	28.57 (2)	25.00 (2)	31.03 (9)	14.29 (1)	16.67 (2)	0.00 (0)	0.00 (0)	10.72 (3)
1-49	0.00 (0)	40.00 (2)	14.29 (1)	0.00 (0)	10.34 (3)	14.29 (1)	25.00 (3)	50.00 (3)	66.67 (2)	32.14 (9)

Figure in parentheses indicates the number of households

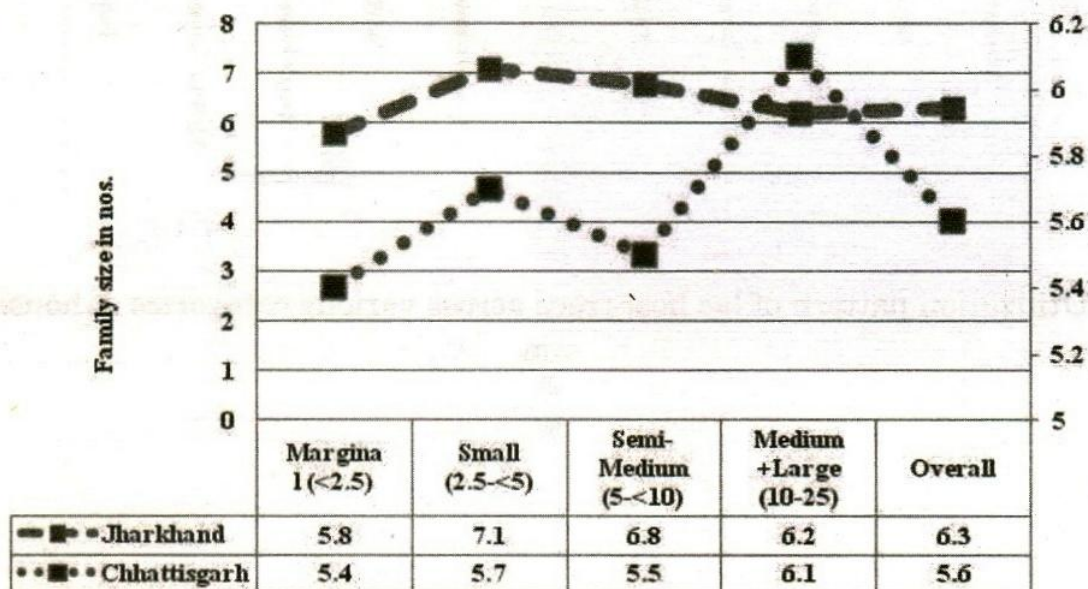


Figure 1: Average family size across various categories of households

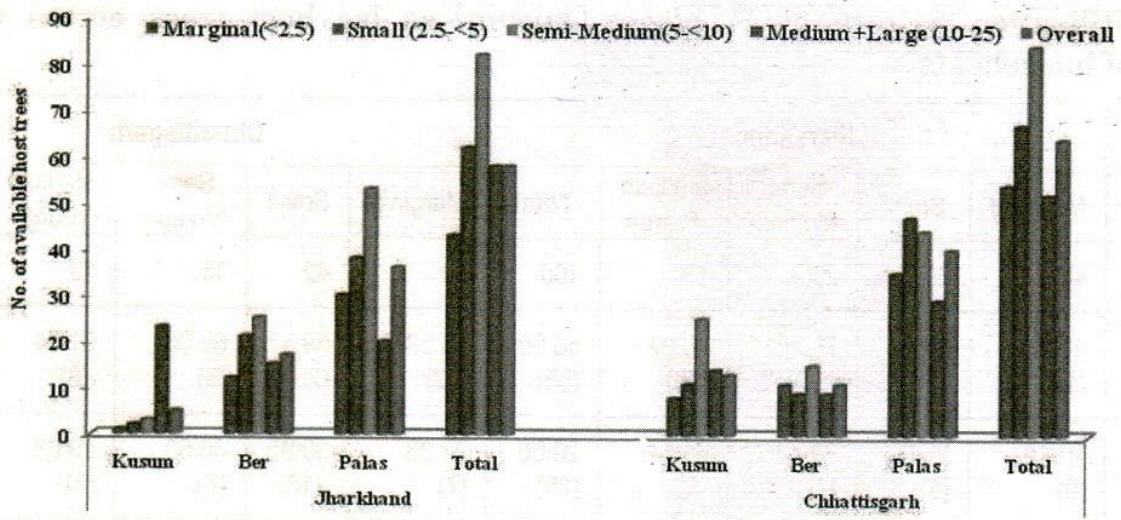


Figure 2: Availability of lac host trees across various categories of households

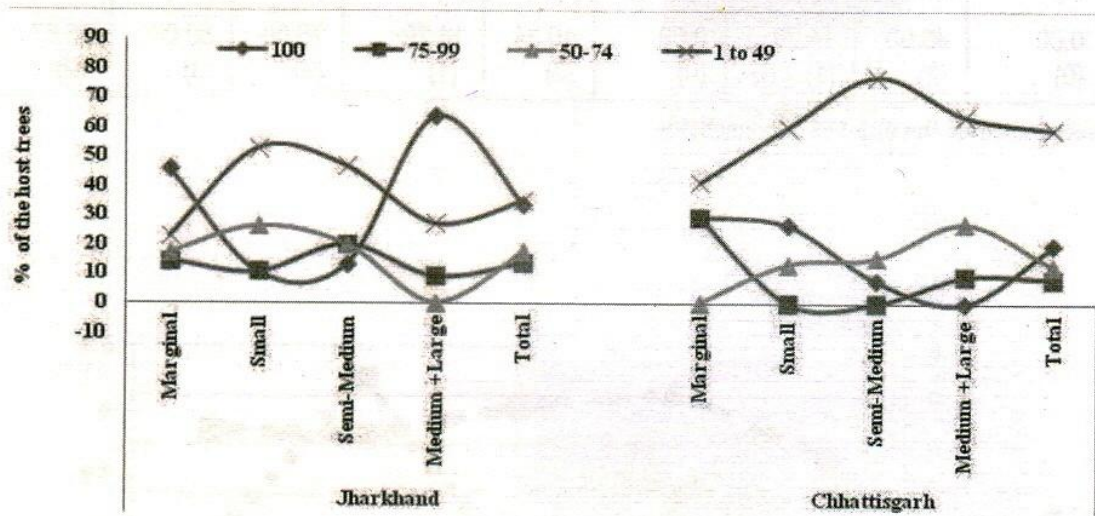


Figure 3: Utilization pattern of lac host trees across various categories of households