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Association of socio-economic profiles with constraints in adoption of *Rangini* lac production technology by the tribal farmers of Chhattisgarh

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Abstract
In this research, we analyze the association of socio-economic profiles with constraints in adoption of *Rangini* lac production technology by the tribal farmers of Chhattisgarh, To serve this purpose total 120 respondents were taken from 2 blocks of Korba district in the year 2018-19. The pre structured interview schedule was used for the data collection. The majority of the respondents 75.84 per cent were educated up to primary school. majorly nuclear family is dominant with proportion of 95.84 per cent majority of the respondents 67.50 per cent were resided in family having up to 5 members in their household, majority of the respondents 86.66 per cent had not participated in any of the social organization, gender participation in *Rangini* lac production male 100.00 per cent, majority 40.00per cent of the respondents had lac production experience of 11 to 20 years, majority of the respondents 64.16 per cent were earned Rs.50,001 to 1,00000 annually, out of total respondents, most of the respondents 57.50 per cent were belonged to small category of farmers with acquisition of land from 1.1 to 2.0 hectare that all the respondents were engaged in agriculture with minor forest product, source of credit, 76.66 percent of the respondents had taken credit from nationalized bank, that the majority of the respondents 43.33 per cent earned to Rs.3001 to 5000.00 per annum from lac production.

Introduction
Lac is produced by tiny lac insects which thrive on three commercial hosts, namely Kusum (*Schleichera oliosa)*, Ber (*Ziziphus mauritiana*) and Palas (*Butea monosperma*). Production of lac is subsidiary source of income for rural and sub-forest dwellers. The Indian lac insect Kerria lacca (Kerr) has two strains of lac insects commonly called *Kusumi* and *Rangeen*i. Both the strains produce two crops in each year. The two lac corps of *rangeen*i insects are summer season (*Baisakhi)* and rainy season (*Katki*) which mature in June-July and October-November respectively. Similarly Lac crop of *Kusumi* insects are summer *(Jethwi)* and winter *(Aghani)* each of which around six month maturing in June-July and January-February respectively.

Research Methodology
The study was conducted in Korba district of Chhattisgarh state during 2018-19. Chhattisgarh state is divided into 27 districti,e., Sarguja, Balrampur, Surajpur, Koria, Bilaspur, Mungeli, Korba, Jashpur, Kabirdham, Durg, Balod, Bemetara, Raipur, Balodabazar, Gariyaband, Janjgir-Champa, Raigarh, Rajnadgoan, Dhamtari, Mahasamund, Kanker, Bastar, Kondagaon, Sukma, Dantewada, Narayanpur and Bijapur. Out of these, Korba district was selected purposively because this district having maximum forest area and cultivation of *Rangini* lac in the state. Korba district has 5 blocks namely Korba, Kartala, Katghora, Pondi-Uprora and Pali. Out of these 5 blocks, only two blocks namely Korba and Pondi-Uprora will be selected purposively for the study. Four representative villages from each of the selected block will be selected randomly among the lac growing villages of the respective block. In this way, total 8 villages will be considered for this study. 15 *Rangini* lac producers were selected randomly from each of the selected randomly from each of the selected village. In this way, a total of 120 *Rangini* lac producers were considered as respondents for study purpose. The data was collected personally by using structured interview schedule and appropriate statistical tools will be used for the computation and analysis of research data.

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Results and Discussion
Education
The data reveals that the majority of the respondents (75.84%) were educated up to primary school followed by 8.33 per cent illiterate respondents, while only 7.50 and 5.00 per cent respondents are educated up to middle, high school and higher secondary level respectively.

It was also observed that less proportion of the respondents (3.33%) were qualified up to under graduate and Above on the basis of a some finding it may be concluded that majority of the lac growers are very less educated up to primary level and proportion of the middle, high school and graduate respondents is negligible. Narbaria (2013) reported in his study that most of the farmers have educated up to middle school level, on the basis of above findings it may be concluded that emphasis should be given to educated the farmers which may he increase the rate of adoption of improved lac culture technology.

Table 1: Distribution of the respondents according to their socio-economic profiles (n=120)

S.N.	Particular	Frequency	Percentage
	1. Education		
i.	Illiterate	10	8.33
ii.	Primary school	91	75.84
iii.	Middle school	9	7.50
iv.	High school & Higher secondary	6	5.00
v.	Under graduate and Above	4	3.33
	2. Family type		
i.	Nuclear	115	95.84
ii.	Joint	5	4.16
	3. Family size		
i.	Small family (Up to 5 Members)	81	67.50
ii.	Medium family (6-8 Members)	33	27.50
iii.	Large family (More than 8 Members)	6	5.00
	4. Social participation		
i.	No participation	104	86.66
ii.	Member of one organization	13	10.84
iii.	Member of two organizations	3	2.50
	5. Experience in *Rangini* lac production		
i.	Low (Up to 10 years)	42	35.00
ii.	Medium (11 to 20 years)	48	40.00
iii.	High (Above 20 years)	30	25.00

Family type
In the study area, majorly nuclear family is dominant with proportion of 95.84% while, only 4.16 percent farmers were resided in joint family system. On the basis of above, it may be concluded that, the nuclear family system may also be influence the adoption of improved lac cultivation practices. Lakra (2011) [9] also reported similar findings in his study.

Family Size
The result reveals that majority of the respondents (67.50%) were resided in family having up to 5 members in their household, followed by 27.50 percent of the respondents were having 6 to 8 members and only 5.00 percent respondents were living in family with more than 8 members in their family. Ghosh *et al.* (2004) [5] also reported in his study.

Social Participation
As human beings are known as social elements they can't survive unless being a party any social organization prevailing in the village. Countries with well developed social

organization are considered to have greater adaptive capacity than those with less effective organizational arrangements. It has depicted in Table 1 that majority of the respondents (86.66%) had not participated in any of the social organization, whereas, 10.84 percent were having the membership of one organization, while, 2.50 percent respondents had very low participation in different social organizations. Verma, (2009) [18] also reported similar findings in his study.

Gender participation in *Rangini* lac production
The reveals that the there was an active participation of male in various lac production practices. In pruning of host tree and harvesting practices of lac production, cent percent participation of only males and in brood lac inoculation and insect pest management practices of lac production, male and female combine participation.

Data shown that 79.16 percent and 20.84 percent in brood lac inoculation practice and 85.84 percent and 14.16 percent in insect pest management, males and females participation respectively. In scraping practices of lac production females participation 74.17 percent is higher than males 16.66 percent and children 9.17 percent. In *phunki* removal practices of lac production major participation taken by males 66.66 percent followed by females 25.00 percent and children 8.34 percent. The findings are in line with results of Ram and De (2003) [13], Palani chamy (2011) [11] and Longchar and Longkumar (2012) [10].

Experience in *Rangini* lac production
It is clear from the data given in Table 1 that majority (40.00%) of the respondents had lac production experience of 11 to 20 years, followed by 35.00 percent respondents had experience up to 10 years about *Rangini* lac production. Whereas 25.00 percent respondents were have experience more than 20 years in this regard. Sujatha, *et al.* (2006) [16] also reported similar findings in their study.

Annual income
Result reveals that majority of the respondents (64.16%) were earned Rs.50,001 to 1,00000 annually, followed by 33.33 percent respondents with annual income of less than Rs.50,000 per annum. While, 1.67 percent respondents were earned Rs. 1,00001 to 1,50,000 annually.

Table 2: Distribution of the respondents according to their family annual income from all sources (n=120)

S.N.	Annual income	Frequency	Percentage
1.	Low (Less than Rs. 50,000)	40	33.33
2.	Medium (Rs. 50,001 to 1,00000)	77	64.16
3.	High (Rs. 1,00001 to 1,50,000)	2	1.67
4.	Very high (More than Rs. 1,50,0000)	1	0.84

There were very less respondents (0.83%) which annual income was ranged between Rs. More than Rs. 1,50,000 per annum from all sources.

Land holding
Most of the respondents (57.50%) were belonged to small category of farmers with acquisition of land from 1.1 to 2.0 hectare, followed by respondents belonging to semi medium and marginal farmer category i.e. 20.00 and 15.00 percent respectively.

Table 3: Distribution of the respondents according to their size of land holding (n=120)

S.N.	Land holding	Frequency	Percentage
1.	Marginal (up to 1 ha.)	18	15.00
2.	Small (1.1 to 2 ha.)	69	57.50
3.	Semi Medium (2. 1 to 4 ha.)	24	20.00
4.	Medium (4.1 to 10 ha.)	8	6.67
5.	Large (above 10 ha.)	1	0.83

Whereas, 6.67 percent respondent possessed 4.1 to 10 hectare land who came under the medium farmers category, only 0.83 percent farmers belonged to large farmers category with ownership of more than 10.0 hectare of land. Verma (2009) [18] also reported similar findings in his study.

Occupation
The finding shows that all the respondents were engaged in Agriculture with minor forest product, which was followed by 71.66 percent respondents were engaged in agriculture labour as subsidiary occupation. Whereas, 47.50 percent respondents were practiced animal husbandry as their secondary occupation. There were few respondents who were also have the subsidiary occupation of business and Govt. service which

were 1.66 and 0.83 percent respectively. Lakra (2011) [9] was also reported similar findings regarding earning pattern of the respondents.

Table 4: Distribution of the respondents according to their occupation (n=120)

S.N.	Occupation	Frequency	Percentage
1.	Minor forest product	120	100
2.	Agriculture	120	100
3.	Agriculture labour	86	71.66
4.	Animal husbandry	57	47.50
4.	Service	1	0.83
5.	Business	2	1.66

* Data are based on multiple responses

Credit acquisition
So far as the credit facilities is concerned, that all the respondents were acquired credit for agricultural as well as other propose including lac production. In case of source of credit, 76.66 percent of the respondents had taken credit from nationalized bank, followed by 52.50 percent of the respondents who were tooked credit from cooperative society.

Table 5: Distribution of the respondents according to their credit acquisition (n=120)

S. N.	Particular	Frequency	Percentage
1.	No acquired	0	0.0
2.	Acquired	120	100.00
	Source of credit		
1.	Friends	11	9.16
2.	Relatives	6	5.00
3.	Co- operative society	63	52.50
4.	Nationalized bank	92	76.66
	Availability of credit		
1.	Easy	93	77.50
2.	Difficult	27	22.50

Whereas 9.16 percent of the respondents acquired credit from friends and 5.00 percent respondents had borrowed money / kind from their relatives. In case of ease of availability of credit 77.50 percent respondents said that they have acquired credit easily, while 22.50 percent respondents faced difficulties in credit acquisition. These finding were found similar to the result reported by Shrivastava, (2005) [15] in his study.

Annual income from *Rangini* lac cultivation
The data given in Table 6 describes the respondent's income

from *Rangini* lac production. The result reveals that the majority of the respondents (43.33%) earned to Rs.3001 to 5000.00 per annum from lac production followed by 35.84 percent respondents who earned Rs. 1001 to 3000 annually from *Rangini* lac, About 13.33 percent respondents who earned Rs. 5001 to 7000 per year *Rangini* lac production, Followed by 5.00 percent respondents who earned above Rs. 7000 annually from *Rangini* lac production, 2.50 percent respondents who earned Rs. up to 1000 per year through *Rangini* lac production.

Table 6: Distribution of the respondents according to their annual earnings from *Rangini* lac (n=120)

S. N.	Annual income (Rs.)	Frequency	Percentage
1.	Up to 1000	3	2.50
2.	1001- 3000	43	35.84
3.	3001 - 5000	52	43.33
4.	5001- 7000	16	13.33
5.	Above 7000	6	5.00

Average annual income/ house hold (in Rs.) 2519.00

Coefficient correlation of independent variables with constraints of recommended *Rangini* lac production technology
It is obvious from the data in Table 7 shows that the variables land holding and adoption level were found positively and highly significant related with constraints at 0.01 percent level of significance.
The positive significant relationship shows that when the level

of the above variables *viz.* annual income and adoption increases, then the constraints of recommended *Rangini* lac production technology practices by the respondents will also increase. The variables education and annual income from *Rangini* lac cultivation were found negatively and non significant related with adoption at 0.05 percent level of significance.

Table 7: Coefficient correlation of independent variables with constraints of recommended *Rangini* lac production technology

S. N.	Independent variable	Coefficient of correlation "r" value
1.	Education	-0.1980*
2.	Social participation	0.0390
3.	Gender participation in *Rangini* lac production	0.0298
4.	Experience in *Rangini* lac production	-0.0413
5.	Annual income	-0.0402
6.	Land holding	0.2601**
7.	Occupation	-0.1832
8.	Credit acquisition	0.0386
9.	Annual income from *Rangini* lac cultivation	-0.262**
10	Cost of production in *Rangini* lac production (per year)	-0.0002
11.	Production per house hold (per year)	0.04898
12.	Scientific orientation	0.00030
13.	Knowledge level	-0.0787
14.	Cosmopoliteness	-0.0906
15.	Utilization of information sources	0.18147
16.	Frequency of inoculation (per year)	-0.0867
17.	Adoption level	0.549**

** Significant at 0.01 level of probability (0.262) (Tabulated value)
*Significant at 0.05 level of probability (0.195) (Tabulated value)

The variables social participation, gender participation in *Rangini* lac production, experience in *Rangini* lac production, annual income, occupation, credit acquisition, cost of production in *Rangini* lac production (per year), production per house hold (per year), scientific orientation, knowledge level, cosmopoliteness, utilization of information sources and frequency of inoculation (per year) were found no relationship with constraints.

Multiple regression analysis of independent variables with constraints of recommended *Rangini* lac production technology

Multiple regression analysis of selected independent variables constraints faced about practices was carried out and the findings are arranged in the Table 8. The findings reveal that adoption had negative and significant contribution at 0.01 level of probability and its 'b' value was 0.198. It means that if other variables keep constant then a unit change in adoption will increases the value of dependent variable (constraints) by 0.380 unit.

Table 8: Multiple regression analysis of independent variables with constraints of recommended *Rangini* lac production technology

S. N.	Variables	Regression coefficient	
		"t" value	"b" value
1.	Education	-0.041	-0.411
2.	Social participation	.116	1.153
3.	Gender participation in *Rangini* lac production	-0.045	-0.471
4.	Experience in *Rangini* lac production	.024	.263
5.	Annual income	.041	.425
6.	Land holding	.150	1.485
7.	Occupation	.277	2.755
8.	Credit acquisition	.012	.119
9.	Annual income from *Rangini* lac cultivation	-0.19*	.2.03
10	Cost of production in *Rangini* lac production (per year)	-0.150	-1.471
11.	Production per house hold (per year)	.007	.068
12.	Scientific orientation	.048	.466
13.	Knowledge level	.012	.121
14.	Cosmopoliteness	-0.159	-1.681
15.	Utilization of information sources	.200	2.114
16.	Frequency of inoculation (per year)	-0.009	-0.097
17.	Adoption	-2.80**	.380

** Significant at 0.01 level of probability ("t" value 2.62)
*Significant at 0.05 level of probability ("b" value 1.98)
$R^2 =0.650$

Similarly, annual income from *Rangini* lac cultivation was negative significant contribution at 0.05 level of probability. The R^2 value was 0.650. It shows that, all the independent variables that were selected for this analysis jointly contribute to 65 percent variation in *Rangini* lac production technology. The remaining 35 percent variation in the dependent variable was contributed by the other variable that was not included in this study.

Conclusion
From the above findings, it can be concluded that majority of the respondents were educated up to primary school, nuclear family size, up to 5 members in their household, not participated in any of the social organization and 11 to 20 years of experiences in lac production technology. Majority of the respondents were earned Rs. 50,001 to 1,00000 annually, small category of farmers with acquisition of land from 1.1 to

2.0 hectare, all the respondents were engaged in minor forest product, cent percent of the respondents acquired credit, majority of the respondents earned to Rs. 3001 to 5000 per annum from lac production.

The results of correlation coefficient clearly indicated that the land holding and adoption level were found positive and highly significant related with constraints at 0.01 percent level of significance.

The multiple regression analysis reveals that the adoption had negative and significant contribution at 0.01 level of probability and its 'b' value was 0.198. It means that if other variables keep constant then a unit change in adoption will increases the value of dependent variable (constraints) by 0.380 unit.

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