Capacity Building Programme on Scientific Lac Cultivation, Processing, Uses and their Correlates

Alok Kumar[1] and A.K. Jaiswal[2]

1. Sr. Scientist, 2. Principal Scientist & Head, TOT Division, Indian Institute of Natural Resins and Gums,
Namkum, Ranchi-834010, Jharkhand.
Corresponding author e-mail: alok.education@gmail.com

ABSTRACT

The investigation aimed to study the impact of capacity building programmes on scientific lac cultivation, processing and uses in terms of knowledge level of farmers. The study was conducted at TOT division, Indian Institute of Natural Resins & Gums (IINRG) Namkum, Ranchi during Nov. 2013 to May 2014. IINRG conducted 17 courses, in which 519 participants were participated; Out of which 125 farmers were randomly selected as respondents for this study. The investigation showed that education, farm size, social participation, lac experiences and sources of information were positively and significantly related to knowledge level of farmers at 5 % level of significance whereas the remaining independent variables viz., age, sex, caste, type of family, family size, occupation and monthly income were not significantly related to knowledge level of farmers on lac cultivation. The percentage changes in knowledge level of respondents towards lac cultivation were found to be 9.60 per cent, 68 per cent and 22.40 per cent, respectively for below average knowledge, average knowledge and above average knowledge after training. . The impact of capacity building programme was gain in knowledge level after training which was significantly higher among farmers for all the lac cultivation practices.

***Key words:** Capacity building; Knowledge level; Scientific lac cultivation:*

Lac is a natural resinous substance of profound economic importance in India. It is the only resin from animal origin lending itself to diverse applications *e.g.* as a protective and decorative coating in the form of thin films, adhesives and plastics. It makes a small but significant contribution to the foreign exchange earning of the country, but the most important role that lac plays in the economy of the country is that roughly 3-4 million tribal people, who constitute the socio-economically weakest link of Indian population earn a subsidiary income from its cultivation. India is the major producer of lac, accounting for more than 50 per cent of the total world production. It virtually helds a monopoly in the lac trade during the period of the world war-I, producing nearly 90 per cent of the world's total output. Today, an average of about 15 -20 thousand tons of stick lac (raw lac) is produced in the country per year. Usually host trees standing on '*Rayyati*' lands are used for lac cultivation and in some areas trees on Government land are taken on lease or rental basis. The country's production of lac was 19,577 tonnes in 2012-13 (*Yogi RK, et.al (2014)*.

Stick lac (crude lac) produced in the country is processed in a large number of factories organized on a cottage industry scale to produce either the seedlac or shellac, before it is exported. These manufacturing centres are distributed throughout the lac-growing areas and handle maximum portion of the country's production. The process of refining is simple and manual labour is employed for the purpose. A fairly large number of skilled workers depend on this industry for employment. Lac cultivation is known as a good source of livelihood for resource poor farmers and assured source of income during drought years.

Lac is considered to be an important cash crop by the poor cultivators (usually the tribal inhabitants) in almost all the major lac-growing states of the country. Most of the lac produced in our country is from homestead land and rural areas, a large number of poor cultivators producing but in very less quantity. For them, there is hardly any investment, except in years of adverse conditions. They either own a few lac hosts or take them out on lease or rental basis, and generally only

part-time family labour is employed. When the lac matures, it fetches them ready cash. Lac cultivators are not very scientific in their profession and the reason, Indian Institute of Natural Resins Gums, Namkum, Ranchi regularly organized capacity building programme on scientific lac cultivation, processing and its uses to make lac cultivation scientifically and bridge the gap by bringing cultivation from conventional to scientific by upgrading their knowledge and temperament.

To find out the success of any programme, a periodic appraisal and evaluation of what is being done is essential, so that suitable changes can be made to make the programme more effective. This creates a need to do some serious evaluation of the programme. Keeping this idea in view, this study was conducted to know the changes in knowledge level of farmers via capacity building programme on scientific lac cultivation, processing, uses and their correlates.

METHODOLOGY

This study dealt with the impact of capacity building programme on scientific lac cultivation, processing, uses of farmers of leading training institution i.e. Indian Institute of Natural Resins and Gums (IINRG) Namkum, Ranchi. Hence, IINRG was purposively selected as the locale of the study. As the investigators were involved in the implementation of this programme, it was easy to get the needed primary data as well as local help for the survey. During November 2013 to May 2014, TOT Division of IINRG, Ranchi conducted 17 courses on capacity building programme on scientific lac cultivation, processing and uses in which 519 participants participated from Jharkhand, Chattisgarh, Odisha, West Bengal, Andhra Pradesh and Bihar states, Out of these 125 farmers were selected randomly as respondents for this study. The major six practices of scientific lac cultivation were selected to find out the extent of knowledge level of farmers having knowledge before training and knowledge after training. The impact of training was assessed through increase in the knowledge level of farmers.

The data was collected through personal interview method with the help of interview schedule. The data was classified, tabulated and analyzed in accordance with the objective framed out under study. For the purpose of study, knowledge level of the respondents about lac cultivation was measured with the help of the knowledge index, specially developed for the study purpose. The items included in the knowledge index were: Pruning of host trees, inoculation, removing used-up broodlac sticks from host trees, crop monitoring (protection) and crop harvesting. A total of twelve independent variables were selected to find out the effect of these on the knowledge level of the respondents on lac cultivation. The selected independent variables were age, sex, caste, type of family, family size, education, occupation, farm size, monthly income, social participation, lac experiences and sources of information utilized. The main statistical tools and techniques used for this study were percentage, correlation, regression, multiple regressions, F test and t-test.

RESULTS AND DISCUSSION

Degree of knowledge towards lac cultivation: The knowledge level was obtained from the overall mean score of the respondents and based on the mean score, standard deviation was calculated. On the basis of overall mean score and standard deviation the knowledge level of the respondents were classified into three categories- below average, average and above average knowledge.

Table 1. Categorization of respondents according to the degree of knowledge towards lac cultivation before training (N=125)

Degree of knowledge level	Av. knowledge score before training	No.	%
Below average	≤ 5.79	27	21.60
Average	5.79 to 14.28	80	64.00
Above average	≥ 14.28	18	14.40

Note- Mean= 10.03 and Standard Deviation = 4.24

(i) Knowledge level towards Lac cultivation before training: Table 1 revealed that the respondents who obtained the mean score below and equal to 5.79 were classified as having below average knowledge towards the lac cultivation before attending the training programme and their frequency and percentage were 27 and 21.60 per cent, respectively.

The respondents who obtained the mean score between 5.79 to 14.28 were classified as having average knowledge towards the lac cultivation before attending the training programme and their frequency and percentage were 80 and 64 per cent, respectively.

The respondents who obtained the mean score

more than or equal to ≥14.28 were classified as having above average knowledge towards lac cultivation before attending the training programme and their frequency and percentage were 18 and 14.40 per cent, respectively.

(ii) Knowledge level towards lac cultivation after training: Table 2 revealed that the respondents who obtained the mean score below and equal to 17.14 were classified as having below average knowledge towards the lac cultivation after attending the training programme and their frequency & percentage were 15 and 12 per cent, respectively.

The respondents who obtained the mean score between17.14 to 23.62 were classified as having average knowledge towards the lac cultivation after attending the training programme and their frequency & percentage were 84 and 67.20 per cent, respectively.

The respondents who obtained the mean score more than or equal to ≥ 23.62 were classified as having above average knowledge towards lac cultivation after attending the training programme and their frequency & percentage were 26 and 20.80 per cent, respectively.

Table 2. Categorization of respondents according to the degree of knowledge towards lac cultivation after training (N=125)

Degree of knowledge level	Av. knowledge score after training	No.	%
Below average	≤ 17.14	15	12.00
Average	17.14 to 23.62	84	67.20
Above average	≥ 23.62	26	20.80

Note- Mean= 20.38 & Standard Deviation = 3.24

(iii) Changes in knowledge level towards lac cultivation: Table 3 revealed that the respondents who obtained the mean score changes in after & before training below and equal to 6.07 were classified as having below average knowledge towards the lac cultivation and their frequency and percentage were 12 and 9.60 per cent, respectively. The respondents who obtained the mean score changes in after & before training between 6.07 to 14.6 were classified as having average knowledge towards the lac cultivation and their frequency & percentage were 85 and 68 per cent, respectively.

The respondents who obtained the mean score changes in after & before training more than or equal to ≥ 14.6 were classified as having above average knowledge towards lac cultivation and their frequency & percentage were 28 and 22.40 per cent, respectively.

Table 3. Categorization of respondents according to the changes in degree of knowledge towards lac cultivation (N=125)

Degree of knowledge level	Av. knowledge score after & before training	No.	%
Below average	≤ 6.07	12	09.60
Average	6.07 to 14.6	85	68.00
Above average	≥ 14.6	28	22.40

Note- Mean= 10.33 & Standard Deviation = 4.26

The above table showed that majority of the selected respondents have average knowledge towards the scientific lac cultivation and after that respondents have above average knowledge, it means respondents have very optimistic views towards scientific lac cultivation and few respondents have below average knowledge level towards scientific lac cultivation. It also reveals that training programme has positive and significant effect on farmer's knowledge on scientific way of lac cultivation /practices. The finding is in line with the findings of Kharde *et al.* (2009) Savita et al (2014)

Influence of training programme on different practices of scientific lac cultivation: It is clear from the data in Table 4, that knowledge gain after training was significantly high among farmers for all the lac cultivation practices.

In case of pruning of host plants practices, before training around 19.2 per cent respondents were aware about this important event and after training 51.2 per cent understood that how and when pruning should be done for different lac host plant. Therefore, 32 per cent more farmers get acquainted with the knowledge & concept of such practice to get maximum output from lac cultivation.

Similarly in inoculation practices in lac cultivation, before training around 17.6 per cent respondents were knowing about this event and after training 54.4 per cent clearly understood that how, how much and when broodlac may be inoculated to different lac host plant to get maximum output from lac cultivation therefore 36.8 per cent more farmers were well aware about the concept of inoculation in lac cultivation.

The other practices *i.e.* removing used-up broodlac sticks from host trees, before training around 28.8% respondents were aware about this important event and after training 78.4 per cent understood the importance of removing broodlac from different lac host plant.

Therefore 49.6 per cent farmers acquaint the basic concept of such practice to get maximum output from lac cultivation.

In case of crop monitoring (protection) practices, before training only 11.2 per cent respondents were aware about this important event and after training 41.6 per cent understood that how and when protection measures will be done for different Lac host plant therefore only 30.4 per cent more farmers acquaint the knowledge & concept of crop protection to get maximum output from lac cultivation. Such practices is related with the commercial & english name of pesticides and fungicides and their doses at different interval is little bit difficult to understand that may be the reason why changes in knowledge level is low in comparison to other practices. The finding is in line with the findings of *Khurana et al (2007)* and *Choudhary et al (2010)*.

Table 4. Knowledge level of farmers before, after and changes on different practices of scientific lac cultivation (N=125)

Lac cultivation practices	Farmers having knowledge		
	Before training No.(%)	After training No.(%)	Changes in knowledge No.(%)
Pruning of host plants	24 (19.2)	64(51.2)	40 (32.0)
Inoculation	22(17.6)	68(54.4)	46 (36.8)
Removing used-up broodlac sticks from host trees	36(28.8)	98(78.4)	62 (49.6)
Crop monitoring (Protection)	14(11.2)	52(41.6)	38 (30.4)
Crop harvesting	34(27.2)	82(65.6)	48 (38.4)
General aspects on Lac	39(31.2)	86(68.8)	47 (37.6)

In case of crop harvesting practices, before training around 27.2 per cent respondents were aware about this event and after training 65.6 per cent under stood that how and when harvesting of mature crops should be done from different lac host plant. Therefore 38.4 per cent more farmers get acquainted with the basic concept of crop harvesting.

Relationship between variables with the knowledge level of farmers on scientific lac cultivation practices: The relationship between the selected independent variables with the dependent variable was tested with the help of correlation.

Table 5. Relationship between selected independent variables with the knowledge level on lac cultivation

Independent variables	r- values
Age	0.0638
Sex	0.1347
Caste	0.0532
Type of family	0.0436
Family size	0.0437
Educational level	0.6278*
Occupation	0.0343
Farm size	0.8647*
Monthly income	0.0375
Social participation	0.8263*
Lac experiences	0.6356*
Sources of information utilized	0.3713*

*Significant at 0.05 % level of probability

(i) *Correlation with twelve independent selected variables related to the knowledge level of farmers:* A critical examination of the data presented in Table 5 reveals that education, farm size, social participation, lac experiences and sources of information utilized were positively and significantly related to knowledge level of farmers at 5 per cent level of probability whereas the remaining independent factors viz., age, sex, caste, type of family, family size, occupation and monthly income were not significantly related to knowledge level of farmers. It means that these variables do not exert their influence on the knowledge level of farmers on scientific lac cultivation practices. The finding is in line with the findings of *Joseph et al (2007)*.

(ii) *Multiple regression equation with knowledge of farmers:* To predict the relationship of important independent variables, the technique of multiple regression was used. The technique was used to determine the effect of these selected independent variables on the dependent variable i.e. knowledge level of the farmers.

A close study of the data in table 6 indicated that all twelve independent variables taken together explained to the extent of 61.32 per cent variation in the knowledge level on lac cultivation of the farmers. The calculated 'F' value was 5.17 at 12 and 124 degree of freedom which was significant at 5 per cent level of significance. Thus, the result implied that all twelve independent variables taken together would account for a significant amount of variation in the knowledge level on lac cultivation of the farmers.

Table 6. Multiple Regression analysis of selected independent variables with the knowledge level of farmers

Independent variables	b-value	S.E. of b-value	t-value
Age	0.4312	4.0952	0.3541
Sex	3.5034	2.1380	1.1588
Caste	1.8320	2.5276	1.3241
Type of family	0.0594	0.1169	0.6082
Family size	1.5324	2.7276	1.0963
Educational level	5.9944	4.7861	4.6232*
Occupation	3.3932	1.0910	1.1103
Farm size	4.3434	2.6054	3.4374*
Monthly income	0.5342	0.8483	0.3371
Social participation	0.8440	1.3263	3.4363*
Lac experiences	6.1602	3.1963	2.2454*
Sources of info. utilized	4.2391	2.2921	2.4666*

*Significant at 0.05 % level of Probability

$R^2 = 0.6132$,   Intercept constant (a) = 79.35

'F' calculated = 5.17* at 12, 124 d.f.

Further the 't' test of significance expressed that age, sex, caste, type of family, family size, occupation and monthly income was found non-significant which means that these variables were not contributing significantly in predicting the knowledge level on Lac cultivation of the farmers. On the other hand coefficient of regression was found positively significant for education, farm size, social participation, lac experiences and sources of information utilized at 5 per cent level of significance. It means that these variables were contributing significantly in predicting of knowledge level on lac cultivation of the farmers. Therefore attention has to be made with due care in education, farm size, social participation, lac experiences and sources of information utilized for enhancing knowledge level of farmers on scientific lac cultivation.

CONCLUSION

The impact of capacity building programmes of IINRG, Ranchi knowledge gain after training which was significantly higher among farmers for all the lac cultivation practices. Education, farm size, social participation, lac experiences and sources of information utilized were positively and significantly related to knowledge level on lac cultivation of farmers at 5 per cent level of probability. It means that these variables were contributing significantly in predicting of knowledge level of the farmers on lac cultivation, whereas the remaining independent factors *viz.*, age, sex, caste, type of family, family size, occupation and monthly income were not significantly related to knowledge level on lac cultivation. It means that these variables do not exert their influence on the knowledge level of farmers on lac cultivation.

REFERENCES

Chaudhary, K.P., Prasad, A., Ram, O and Pandey, O.K (2010). Assessment of awareness and knowledge level of farmers about ipm technologies in mustard crop profile of farm women and its influence on knowledge gain and retention through communication methods. *J. of Commu. studies,* Vol. XXVIII, No.-3, pp 153-158.

Joseph, R and Padaria, R.N (2007). Impact of KVK'S maize production on training programme on farmers knowledge and adoption level. *Indian J. of Ext. Edu.,* **43** (1&2) : 46-48.

Khurana, D.G., Dhillon, D.S., Kumar, K, Singh, M. (2007). Gain in knowledge of farmers due to multimedia training programmes level. *Indian J. of Ext. Edu.,* **43** (1&2) : 76-80.

Kharde, P.B., Patil, S.S and Navale, K.B (2009). Profile of farm women and its influence on knowledge gain and retention through communication methods, *J. of Commu. studies,* **XXVIII** (3) : 65-79.

Savita, Punia, S. and Singh, C.K (2011). Knowledge of rural women on family life education and related factors. *J. of Commu. studies,* **XXVIII** (3) : 147-152.

Yogi R.K., Bhattacharya A. and Jaiswal A.K. (2014). Lac, Plant Resins & Gums Statistics at a Glance 2013. ICAR- Indian Institute of Natural Resins & Gums, Ranchi (Jharkhand), India. Bulletin (Technical) No. 06/2014. pp 1-38.

● ● ● ● ●