Indian Journal of Extension Education
Vol. 53, No. 1, 2017 (94-99)

Knowledge Level of Students via Capacity Building Programme on Scientific Lac Cultivation, Processing, Uses and their Correlates

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ABSTRACT

The impact of capacity building programme on scientific lac cultivation, processing and uses in terms of knowledge level of students was carried out during January to June 2014 at ICAR-Indian Institute of Natural Resins & Gums (IINRG) Namkum, Ranchi. During the period, IINRG conducted 03 courses exclusively for students of undergraduate & postgraduate students, in which 151 participants participated. Out of 151 participants, 110 students were randomly selected as respondents for this study. The investigation showed education, occupation, farm size, monthly income, social participation and sources of information were positively and significantly related to knowledge level of students at 5 percent level of probability and their t values were 3.14, 2.45, 4.32, 3.64, 4.44 and 3.47, respectively. Maximum respondents have very optimistic views towards scientific lac cultivation and few respondents have below average knowledge level towards scientific lac cultivation. It also revealed that the impact of capacity building programme was knowledge gain after training was significantly high among students for all the lac cultivation practices.

Key words: Capacity building, student, knowledge, scientific lac cultivation

INTRODUCTION

Besides silk and honey commercial products of insect origin, lac is also a product of commercial importance produced by a beneficial insect *Kerria lacca* (Kerr). Millions of these sessile lac insects sustain their life on specific host plants, secreting resin as their body covering, which are eventually harvested in the form of resin, dye and wax of commercial importance. India is the largest producer of lac in the world. Other lac producing countries are Indonesia, Thailand, China, Myanmar, Philippines, Vietnam, and Cambodia *etc.* The country's production of lac was 19,577 tonnes in 2012-13 Yogi *et. al.* (2014). In India, lac production is mainly carried out in the state of Jharkhand, Chhattisgarh, Madhya Pradesh, West Bengal, Odisha, Uttar Pradesh, Andhra Pradesh etc. Millions of lac host trees are available in villages and sub forest areas of these states. The commercial lac host species are *Schleichera oleosa* (kusum), *Ziziphus mauritiana* (ber), *Butea monosperma* (palas) and *Albizia saman etc.* 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. All the components of lac and their value added products find their applications in a variety of industries like food, textile, electrical, pharmaceuticals, perfumery, automobile, paint and surface coating *etc.* 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 and earn a subsidiary income from its cultivation. Simple and easy method of lac cultivation technology coupled with low investment and high return have created interest among the farmers for adoption of lac culture as a profitable venture. Lac cultivation technology can be suitably adopted in areas where irrigation facilities are lacking and farmers are totally dependent on rain water for their agricultural crops. In view of this, lac cultivation becomes a major source of income and livelihood in many rain fed areas where technology is known to farmers. There is no significant impact of drought on lac cultivation as the lac insect culture is raised on tender shoot of host trees which are relatively less affected.

Lac is considered to be an important cash crop by the poor cultivators 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

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poor cultivators are 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, ICAR-Indian Institute of Natural Resins Gums, Namkum, Ranchi regularly organizes capacity building programmes for different stakeholders on scientific lac cultivation, processing and its uses to make lac cultivation scientificand bridge the gap by bringing cultivation from conventional to scientific. 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 students via capacity building programme on scientific lac cultivation, processing, uses and their correlates.

METHODOLOGY

This study dealt with the impact of capacity building programmes on scientific lac cultivation, processing and its uses organized by Indian Council of Agricultural Research-Indian Institute of Natural Resins and Gums (IINRG) Namkum, Ranchi. 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.

A regular capacity building programme on scientific lac cultivation, processing and uses were conducted for students throughout year at IINRG and out of these programmes, respondents were selected randomly. During January to June 2014, TOT Division of IINRG, Ranchi organized three courses on capacity building programme on scientific lac cultivation, processing and uses for the college students in which 151 participants were participated from different states of the country; Out of 151 participants, 110 participants 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 students having knowledge before training and knowledge after training. The impact of training was assessed through increase in the knowledge level of students. The data was collected through personal interview method with the help of interview schedule. The data was directly recorded on the 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 knowledge index, specially developed for this study. The items included in the knowledge index were pruning of host trees, inoculation, removing used-up broodlac sticks from host trees, crop monitoring (protection), crop harvesting and general aspect on lac (post harvest care & others).

A total of eleven 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 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 was classified into three categories- below average, average and above average.

Knowledge level of respondents towards lac cultivation before training-

The respondents who obtained the mean score below and equal to 7.33 were classified as having below average knowledge towards the lac cultivation before attending the training programme and their frequency and percentage were 22 and 20 per cent, respectively (Table 1 & Fig 1).

The respondents who obtained the mean score between 7.34 to15.16 were classified as having average knowledge towards the lac cultivation before attending the training programme and their frequency and percentage were 75 and 68.18 percent, respectively.

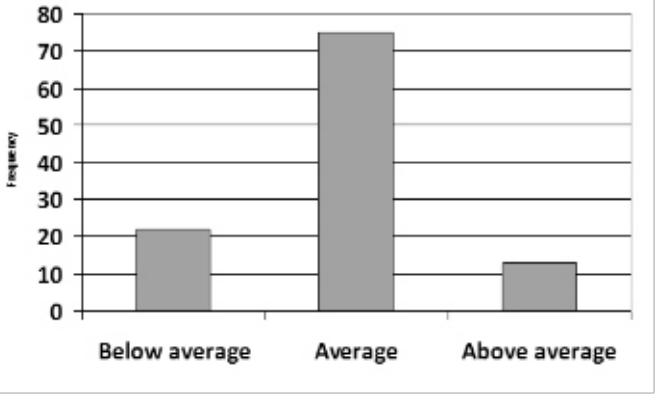
The respondents who obtained the mean score more than or equal to ≥15.17 were classified as having above average knowledge towards lac cultivation before attending the training programme and their frequency and percentage were 13 and 11.81 percent, respectively.

Table 1: Categorization of respondents according to the degree of knowledge towards lac cultivation before training

n=110

Degree of knowledge level	Average knowledge score before training	Frequency	Percentage
Below average	≤7.33	22	20.00
Average	7.34 to15.16	75	68.18
Above average	≥15.17	13	11.81

Figure 1: Degree of knowledge towards Lac cultivation before training



Knowledge level of respondents towards lac cultivation after training

The respondents who obtained the mean score below and equal to 18.46 were classified as having below average knowledge towards the lac cultivation after attending the training programme and their frequency & percentage were 10 and 9 per cent, respectively (Table 2 & Fig 2).

The respondents who obtained the mean score between 18.47 to 26.69 were classified as having average knowledge towards the lac cultivation after attending the training programme and their frequency & percentage were 79 and 71.81 percent, respectively.

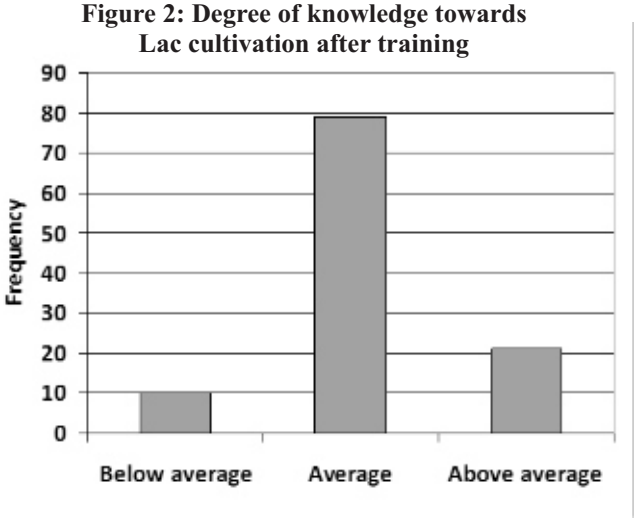
The respondents who obtained the mean score more than or equal to ≥26.70 were classified as having above average knowledge towards lac cultivation after attending the training programme and their frequency & percentage were 21 and 19.09 per cent, respectively.

Table 2: Categorization of respondents according to the degree of knowledge towards lac cultivation after training

n=110

Degree of knowledge level	Average knowledge score after training	Frequency	Percentage
Below average	≤18.46	10	9.00
Average	18.47 to 26.69	79	71.81
Above average	≥26.70	21	19.09

Figure 2: Degree of knowledge towards Lac cultivation after training



Changes in knowledge level of respondents towards lac cultivation-

The respondents who obtained the mean score changes in after & before training below and equal to 6.16 were classified as having below average knowledge towards the lac cultivation and their frequency and percentage were 7 and 6.36 per cent, respectively (Table 3 & Fig 3).

The respondents who obtained the mean score changes in after & before training between 6.17 to 14.27 were classified as having average knowledge towards the lac cultivation and their frequency & percentage were 81 and 73.63 per cent respectively.

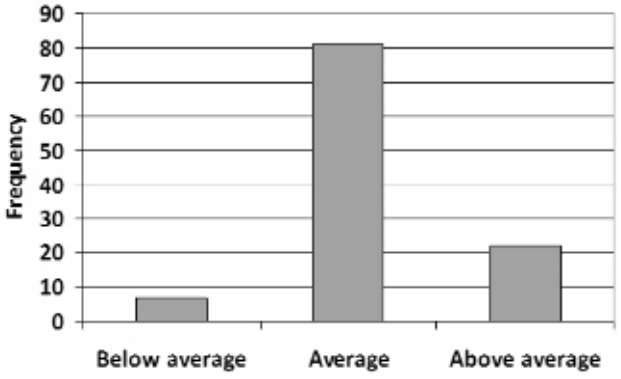
The respondents who obtained the mean score changes in after & before training more than or equal to ≥14.28 were classified as having above average knowledge towards lac cultivation and their frequency & percentage were 22 and 20 per cent, respectively

Table 3: Categorization of respondents according to the changes in degree of knowledge towards lac cultivation

n=110

Degree of knowledge level	Changes in after & before Training Average knowledge score	Frequency	Percentage
Below average	≤ 6.16	07	06.36
Average	6.17 to 14.27	81	73.63
Above average	≥14.28	22	20.00

Figure 3: Changes in degree of knowledge towards Lac cultivation



The above tables and figures show 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 student's knowledge on scientific way of lac cultivation /practices. The finding is in line with the findings of Khadre *et al.* (2009), Savita *et al.* (2014) Kumar & Jaiswal (2015).

Influence of training programme on different practices of scientific lac cultivation and extent of knowledge level

It is clear from the data in table 4, that knowledge gain after training was significantly high among students for all the lac cultivation practices.

In case of pruning of host plants practices, before training around 13.6 per cent respondents were aware about this important event and after training 60.0 per cent were understand that how and when pruning will be done for different lac host plant therefore 46.4 per cent more students acquaint the knowledge & concept of such practice to get maximum output from lac cultivation.

Similarly in inoculation practices in lac cultivation, before training around 15.5 per cent respondents were known about this event and after training 62.7 per cent were clearly understand that how, how much and when broodlac may be inoculated to different lac host plant to get maximum output from lac cultivation therefore 47.2 per cent more students 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 13.6 per cent respondents were aware about this important event and after training, 85.5 percent undersood that importance of removing and when it is to be removed from different lac host plant therefore 71.9 per cent more students aequired the basic concept of such practice to get maximum output from lac cultivation.

In case of crop monitoring (protection) practices, before training, only 16.4 per cent respondents were aware about this important event and after training, 53.6 per cent understand that how and when protection measures will be done for different Lac host plants therefore, only 37.2 per cent more students acquire 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 is the reason, why changes in knowledge level is low in comparison to other practices. The other practices *i.e.* crop harvesting practices, before training, around 10 per cent respondents were aware about this event and after training, 80 per cent were well understand that how and when harvesting of mature crops will be done from different lac host plants therefore, 70 per cent more students were well acquaint with the basic concept of such practice to get maximum output from lac cultivation. Similarly, on general aspects on lac, before training around 10.9 per cent respondents were known about gener aspects of lac and after training total 80 per cent respondents received exposure on such event, therefore, 69.1 per cent more students were updated their knowledge from the training programme on scientific lac cultivation, processing and in uses. The finding is in line with the findings of Kumar & Jaiswal (2015), Khurana *et. al.* (2007) and Choudhary *et. al.* (2010).

Table 4: Knowledge level of students before, after and changes on different practices of scientific lac cultivation

n=110

Lac cultivation practices	No. & % of students having knowledge before training	No. & % of students having knowledge after training	No. & % of students having changes in knowledge
Pruning of host plants	15 (13.6%)	66 (60.0%)	51 (46.4%)
Inoculation	17 (15.5%)	69 (62.7%)	52 (47.2%)
Removing used-up broodlac sticks from host trees	15 (13.6%)	94 (85.5%)	79 (71.9%)
Crop monitoring (Protection)	18(16.4%)	59 (53.6%)	41 (37.2%)
Crop harvesting	11(10.0%)	88 (80.0%)	77 (70.0%)
General aspects on Lac	12(10.9%)	88 (80.0%)	76 (69.1%)

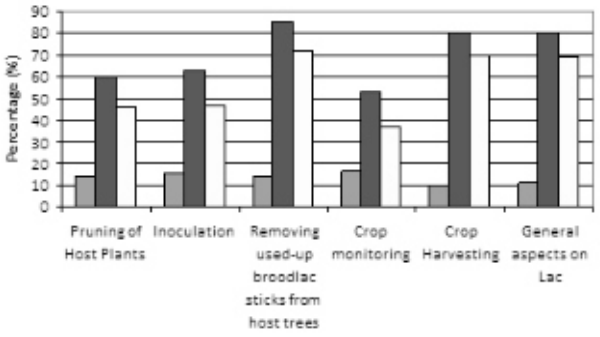


Figure 4: Knowledge before and after training and percentage change in knowledge

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

Correlation with eleven independent selected variables related to the knowledge level of students

The result has been presented below in Table 5:

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

Independent variables	r- values
Age	0.033
Sex	0.114
Type of family	0.047
Family size	0.063
Educational level	0.717*
Occupation	0.464*
Farm s ize	0.624*
Monthly i ncome	0.337*
Social p articipation	0.786*
Sources of information utilized	0.371*

*Significant at 0.05 % level of probability

A critical examination of the data presented in table 5 revealed that education, occupation, farm size, monthly income, social participation and sources of information utilized were positively and significantly related to knowledge level of students at 5 per cent level of probability whereas the remaining independent factors *viz.*, age, sex, caste, type of family and family size were not significantly related to knowledge level of students. It means that these variables do not exert their influence on the knowledge level of students on scientific lac cultivation practices. The finding is in line with the findings of Kumar & Jaiswal (2015) and Joseph *et al* (2007).

Multiple regression equation with eleven independent selected variables related to the knowledge level of students

Predict the relationship of important independent variables, the technique of multiple regressions 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 students.

Table 6: Multiple Regression analysis of selected independent variables with the knowledge level of students

Independent variables	b-Value	S.E. of b- value	t value
Age	1.1320	2.1274	0.35
Sex	0.6514	0.5169	1.15
Type of family	1.4312	4.1312	0.60
Family size	4.2034	2.1380	1.09
Educational level	0.5342	2.6054	3.14*
Occupation	0.7440	0.8483	2.45*
Farm size	4.2291	1.3263	4.32*
Monthly income	3.3432	2.2921	3.64*
Social p articipation	5.1236	1.1980	4.44*
Sources of information utilized	4.2943	4.2161	3.47*

*Significant at 0.05 % level of Probability
R2 = 0.7122 Intercept Constant (a) = 73.35
'F' calculated = 4.97* at 11, 109 d.f.

A close study of the data in table 6 indicated that all independent variables taken together explained to the extent of 71.22 per cent variation in the knowledge level on lac cultivation of the students. The calculated 'F' value was 4.97 at 11 and 109 degree of freedom which was significant at 5 per cent level of significance. Thus, the result implied that all eleven independent variables taken together would account for a significant amount of variation in the knowledge level on lac cultivation of the students.

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

social participation and sources of information for effective knowledge level of students on scientific lac cultivation. The finding is in line with the findings of Kumar & Jaiswal (2015).

CONCLUSION

The impact of capacity building programme was knowledge gain after training was significantly high among students for all the lac cultivation practices. Education, occupation, farm size, family income, social participation and sources of information utilized were positively and significantly related to knowledge level on lac cultivation of students at 5 per cent level of probability. It means that these variables were contributing significantly in predicting of knowledge level of the students on lac cultivation, whereas the remaining independent factors *viz.,* age, sex, caste, type of family and family size 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 students on lac cultivation.

Paper received on : February 11, 2016
Accepted on : February 22, 2016

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