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# Correlates of Adoption of Improved Apiculture Practices in Arunachal Pradesh

**B.P. Mishra[1], Manish Kanwat[2], B.K. Gupta[3], N.R. Meena[4], N.K. Mishra[5] and P. Suresh Kumar[6]**

## ABSTRACT

The increasing population of India is raising alarm to search means for sufficient food for all and the employment for the young generation. The apiary or beekeeping has the potential to become the alternative of those people who needs the employment. The study was conducted in four blocks and four villages of West Siang district of Arunachal Pradesh state are selected to identify the socio-economic and personal factors affecting adoption of improved apiculture practices. The data collected from 120 respondents selected randomly revealed that the personal variable namely age, education, social participation, utilization of sources of information, mass media exposure, annual income, family type, land used, land holding and knowledge level and socio economic status correlated significantly with adoption of improved apiary practices. While correlated the age with the extent of adoption, it was negative but significant and the size of land holding was found to be negative and non-significant. The statistical tests using multiple regression analysis revealed that among the variable studied, education, family type, social participation, mass media exposure, extension contact and the knowledge level were found to exhibit positively significant contribution towards adoption enhancement of apiculture practices.

**Keywords:** Adoption, Apiculture, Correlation, Independent, Variable

## INTRODUCTION

The increasing population of India has posed two formidable challenges before the planners; employment generation for about 35 crore people of the age group between 20 to 40 years, and provision of sufficient and nutritious food to all. Agriculture is the biggest private enterprise in our country. As 60 per cent of the population live in rural area and depend on agriculture, this sector alone can address this uphill task. Beekeeping industry, in its own humble way can contribute to this endeavour by providing part-time employment to about a million people, producing valuable food like honey worth crores of rupees and the most important, increasing the crops yields substantially through bee-pollination of various agricultural and horticultural crops that are dependent on insects for pollination. Apiary, a rural cottage industry is highly suitable for India considering its gigantic agricultural pedestal and its role in providing rural employment particularly to small and marginal farmers. Although it is labour intensive, but it will gives high return too. It can also employ whole family including women. It can also be the solution to reduce the migration of rural people towards the urban area through income generation by this practice (Phadke, 2008). India needs minimum 70 lakh bee colonies to pollinate 12 major crops which are

[1]Associate Professor, Department of Agricultural Extension, BUAT, Banda, UP
[2]Senior Scientist & Head, ICAR-KVK Anjaw, ICAR-AP Centre, Basar, Arunachal Pradesh
[3]Assistant Professor, Department of Agricultural Extension, BUAT, Banda, Uttar Pradesh
[4]Associate Professor, Department of Agricultural Extension, ANDUAT, Ayodhya, Uttar Pradesh
[5]SMS (Agricultural Extension), KVK West Kameng, Arunachal Pradesh
[6]Senior Scientist (Horticulture), ICAR-NRCB, Tiruchirapalli, Tamil Nadu
*Corresponding author email id: bhanumishrabhu@gmail.com

dependent on insects like honeybees for pollination. As against this bare need we have just 15 lakh bee colonies. India produce about70,000 tonnes of honey every year of which 25-27,000 tonnes is being exported to more than 42 countries India has potential to produce 15 million colonies and we do not have even half a million. It is estimated that 70 to 80 per cent of the total honey production of India comes from wild honeybees. Thus about 100 million kg. of honey worth about Rs. 200 crores is annually collected from wild honeybee colonies. All this honey is mostly collected by tribal. Thus from socio-economic considerations this is a very important industry. Products of honey bees are used in cosmetic, life sustaining drug, wax and even manure.

Since arable land remain limited but population is increasing in the hilly state of Arunachal Pradesh, also Food comes from other states of India and is cheaper than the cost of production in Arunachal Pradesh. Therefore, we cannot compete with them commercially in food grain production and need to opt for some other option productive for hilly condition. In this direction, joint efforts of the state organization, AAU, Jorhat and ICAR RC for NEH Region AP Centre, Basar for the promotion of apiary in Arunachal Pradesh are being done to train and motivate the farmers to adopt as enterprise. Kashikar (2000) reported that there was positive relation between the socio economic characteristics of the farmers and extent of adoption of modern apiculture technologies. Socio-economic characteristics of growers directly influence the extent of adoption production and productivity in honey production. In the present study, efforts has been made to identify the extent of adoption of modern apiary practices among the honey producers and investigate the socio-economic and personnel characteristics of apiary unit holders with improvised honey production technologies.

## METHODOLOGY

The study was carried out in Arunachal Pradesh state. The West Siang district of Arunachal Pradesh was selected purposively for study on the basis of maximum farmers have been doing this practices at their own level. The farmers were selected from the four blocks i.e. Basar, Likablai, Tribin and Aalo of Basar and Aalo divisions engaged in the apiary considering the availability of good facility and infrastructure of honey production, nearness from the district headquarter, extensive support service provided by the ICAR and line department and the market availability for sale out their produce. From these four blocks, 4 villages were chosen randomly one village from each block. From each selected villages 30 practicing farmers were selected by random sampling technique. Thus the total numbers of 120 practicing farmers were selected. The research design adopted was exploratory. The data was collected with the help of the direct observation; meetings, discussion and structured interview schedule. The data was subjected to statistical analysis such as frequencies, percentage, regression, multiple regression and association with dependent and independent variables respectively. Regression was calculated and measured where an estimate of knowledge was made by appropriate values of selected variables from $x_{1,}$ $x_2$, $x_3$…….$x_n$ in the general formula,

$$Y = a + b_1x_1 ++ b_2x_2 + b_3x_3……..b_nx_n$$

The extent of adoption of improved apiculture practices of honey producers was studied with reference of to 10 recommended improved farm practices about honey and their by-products on the basis of review of literature and discussion with the expert, like lack of motivation among the farmers, about marketing support, mass media exposure and information access etc. Further, provisions were made for the farmers to indicate the problem.

## RESULTS AND DISCUSSION

It was observed that the majority (68%) of the respondents were in the age group of 35-55 years, educated upto secondary level (30.8%) and 25 per cent of respondents were illiterate. majority (76.6%) of respondents were from the joint type of family and being as tribal community people having high level (55.00) of social participation. Further, 49.1 per cent of area used under the apiary farming under the West Siang district, 55.8 per cent of the respondents were having the medium size of land holdings but more than 20 percent of respondents were also having the big size land holding under the study area. More than half of the respondent

(52.5%) were living under below poverty line with the income of less than Rs. 12,000 per annum and had low level of knowledge about the scientific rearing of the honeybees and their products. Television was often used by 52.5 per cent, farmers meetings were often used by 50.8 per cent and newspaper was never used due to less circulation in the far flung villages. The most often used extension contact was Agriculture Assistant (64.5%), Agriculture Officers from line department (52.5%) whereas, 16.6 per cent never contacted to Agriculture Scientists.

It is evident from Table 1 that the highest mean adoption was obtained by extraction, processing and storage of honey (89.7%) followed by the beehives products (78.6%), bee rearing management (71.6%),biology of honeybees (67.3%), artificial queen rearing techniques are also important (66.6%), and the behaviour of honeybees (61.7%). The composite adoption was 61.56 per cent and the composite mean adoption gap was 38.4%. The reasons for non-adoption of apiary farming as reported were labour intensive, high rainfall prone area, lack of knowledge about the rearing, equipment and their use and lack of knowledge of bee toxicity, where farmers still require the complete knowledge.

It is observed for Table 2 that the correlation coefficient of 9 variables out of 10 variables namely Age, family type, education, area under beekeeping, land holding, source of information, extension contact, annual income, social participation and the knowledge level of the respondent about the practices was significant at 0.01 level of probability with adoption of improved apiary practices. Among this age was found negatively correlated. Further, correlation coefficient of land holding with extent of adoption was negative and non significant. It is clear from the findings that there were significant correlations between majority of characteristics of respondents and extent of adoption of improved honeybee practices. The identical findings were reported by Kashev and Hossain (1992). The variables showing positive and significant relationship need greater attention on the part of extension agency to enhance adoption of apiary rearing practices in the area.

**Table 1: Adoption with respect to selected management practices**

| Category | Adoption among respondent (%) |
|---|---|
| Bee Behaviour | 61.7 |
| Biology of honeybees | 67.3 |
| Beekeeping equipment and their use | 57.8 |
| Bee rearing management | 71.6 |
| Seasonal management (Summer and Winter) | 44.3 |
| Bee disease, pest and enemies management | 59.2 |
| Honeybees and crop production | 53.4 |
| Artificial queen rearing technique | 66.6 |
| Bee toxicity | 27.0 |
| Extraction, processing and storage of honey | 89.7 |
| Beehives products | 78.6 |

**Table 2: Correlation between independent variables and the adoption**

| Correlates | Coefficient of correlation (r) |
|---|---|
| Age | -0.447** |
| Education | 0.732** |
| Family type | 0.639** |
| Land holding | -0.113 |
| Social participation | 0.920** |
| Annual Income | 0.352** |
| Knowledge level | 0.822** |
| Mass media exposure | 0.939** |
| Extension contact | 0.917** |

**Significant at 0.01 level of probability

The regression analysis was performed to find out the effect and extent of influence of each variable towards the level of adoption of improved apiary practices. Out of nine variables six variables, viz., family type, social participation, mass media exposure, extension contact and education of the respondent played vital role to increase the understanding and the knowledge level and ultimately the adoption percentage among the respondent (Table 3). The findings are in conformity with Ramdasi (1998) and Anchule (2000).

The coefficient of determination value $R^2$ was 0.794 which shows that independent variables explained to the

**Table 3: Correlation coefficient**

| Correlates | Coefficient of correlation (r) | Regression coefficient (Bi) | 't' value |
|---|---|---|---|
| Age | -0.447** | -0.001 | -0.074 |
| Education | 0.732** | -3.28 | 6.28** |
| Family type | 0.639** | 0.217 | 1.62** |
| Land holding | -0.113 | -0.030 | 0.864 |
| Social participation | 0.920** | 0.217 | 1.88** |
| Annual Income | 0.352** | -0.009 | 0.053 |
| Knowledge level | 0.822** | -821 | 4.92** |
| Mass media exposure | 0.939** | 0.181 | 3.873** |
| Extension contact | 0.917** | 0.132** | 2.985** |

$R^2$ value = 0.794; F' value = 68.32; **significant at 1% level

extent of 79.40 percent in the composite adoption gain on apiary practices in the selected area.

## CONCLUSION

The study has revealed that eight out of nine variables were significantly correlated with adoption of improved honeybee practices. Six variables were found to contribute towards the beekeepers' adoption of improved apiculture practices namely education, social participation, mass media exposure, family type, extension contact and knowledge level. The farmers of this region consider apiculture a profitable enterprise. Since they have showed a tendency for social participation, they need to be organized into small cooperatives societies for promoting apiculture practices and they have good knowledge regarding the apiary so training on scientific and technical knowhow and handholding for quality and quantity of honey and its' marketing to the other neighboring states can go a long way. Extension strategies should ensure adequate training in participatory methods, communication skills, method demonstrations and advisory services to deal effectively with small and marginal farmers for promotion and adoption of improved apiculture practices. There is greater role for extension to provide technical assistance, appropriate technologies, inputs and to follow systematic approach for encouraging apiary farmers.

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