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Constraints in Adoption of Beekeeping as an Enterprise in Nagaland

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ABSTRACT

Present study was envisaged and accomplished in order to know the constraints of beekeeping adoption by trained peasantry. Hundred beekeepers were randomly selected and their opinion was obtained by administering a questionnaire. The key economic constraints of beekeeping adoption were complications in finance from banks, commencement cost investment beyond the capacity of trained peasantry and lack of government subsidy in apiculture. The relevance of new technology, lack of adequate scientific knowledge and inclination towards traditional beekeeping were also constraints of beekeeping adoption. The socio- psychological constraints unfurled by beekeeping adoption were fear of high risk, fear of sting in beekeeping and perceived low outcome. All respondents realized honey price is very low but about customer reliance their doctrine was divisible; majority of respondents broached positively about customer reliance on honey whereas few faced problem for selling honey.

Key words: Beekeeping, constraints, adoption, enterprise

INTRODUCTION

Beekeeping provides nutraceutical beehive products and endowed pollination and thereby maintains plant biodiversity and density of ecosystem. Apiculture is an ideal agro- based rural enterprise, providing additional income to the rural people. It is an enthralling occupation to the rural people with a good source of income and low cost input. Beekeeping shows great promises of key rural industry and entrepreneurship especially for peasantry. It has proven to be a very good rural enterprise and can be adopted as per the wish of beekeepers viz. as entrepreneurship, side business and as a subsistence beekeeping. It is the most suitable enterprise for landless people, small and marginal farmers, women, disabled people, unemployed youth etc. Besides, it opens way for income generation and employment opportunities through the manufacturing of appliances, processing, packaging and marketing sectors.

Nagaland is a vibrant hill state, dominated mountain ranges, covered by verdant forest with rich biodiversity. The mild temperature and verdant forest with wide range of flora offer incessant food source and make congenial niche for beekeeping. *Apis cerana* is a part of the natural heritage of mountain community which is known as an indigenous bee. Naga beekeepers deal with *A. cerana* species and most of them rear by traditional methods (Anonymous 2009).Tribal populations and forest dwellers rear honey bees in subsistence phase with their traditional profession. They produce honey for their personal consumption and a sizeable volume is sold in local markets where the average productivity is 2-3 kg/ hive. Non-professional beekeepers' honey productivity is very low in comparison to national average production. In sustainable agriculture, apiculture enterprises can enhance the socio-economic profile of rural peasantry.

Multi-government and non- government organization (NGO) functionaries *viz.* AICRP on Honey Bees & Pollinators, Nagaland Beekeeping & Honey Mission, KVK, ATMA *etc.* are involved in encouraging the apiculture in Nagaland. Despite of that, Naga tribal doing subsistence beekeeping whereas do not adopt apiculture as an entrepreneurship and extension functionaries could not succeed to converge their focus on

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scientific beekeeping. Therefore, present envisage is aimed to know the constraints which works as barriers in adoption of apiculture as an entrepreneurship.

METHODOLOGY

The survey was conducted in Medziphema, Dimapur district of Nagaland. This area was selected purposively because most of the extension functionaries under NBHM, AICRP (Honey Bees & Pollinators) SASRD, ATMA and KVK conducted numerous beekeeping training programs and established a Tribal Sub Plan (TSP).One hundred trained persons by various agencies were selected randomly from seven villages (Medziphema, Sochunuma, Kukidolong, Sirhima, Pherima, Khervom and Molvom).

The extent of apiculture adoption level was studied over the period of three years after conductance of training programme. The respondents were categorized on the basis of training year *viz.* 1st year, 2nd year and 3rd year. To analyze the constraints of apiculture adoption, questionnaires were prepared that included socio-psychological, economic, technological and marketing areas after discussions with different field experts of beekeeping; extension functionaries, scientists, psychology student and beekeepers.

The seriousness of each constraint was measured on five levels-Very Much, Much, Do Not Know, Not So Much and Not At All, which were allotted scores of 4, 3, 2, 1 and 0, respectively. The respondent score data were analyzed by mean score values. A sum of score was calculated for each constraint and rank orders were arranged accordingly.

RESULTS AND DISCUSSION

Adoption

The data reveals that the adoption of beekeeping was low among the respondents. After training, in first year only 18 per cent of respondents adopted the beekeeping, while 82 per cent of respondents did not adopt. In second year, it was observed that 27 per cent respondents adopted beekeeping which was higher than the first year. Beekeepers' proportion decreased and only 22 per cent trained respondents continued beekeeping till the end of third year. The low adoption occurred due to various constraints. Beekeeping adoption was low in the first year but increased in the second year, whereas in the third year it decreased. This ramified result might be due to various difficulties of beekeepers.

Table 1: Adoption of beekeeping among trained persons

Year	Adopted Per cent	Not adopted Per cent
1st year	18	82
2nd year	27	73
3rd year	22	78

Constraints

(I) Economic

Data explicates that the economic constraint is the primary hurdle to adopt beekeeping as entrepreneurship. These constraints have been arranged in terms of mean score values (MSV) in ascending order. The majority of respondents blamed the complications involved in finance from banks(MSV of 2.38± 0.10) as the most serious constraint and ranked first followed by scarcity of money, lack of subsidy in apiculture, lack of continuous income generation and high capital input during commencement ranked fifth (MSV 0.28± 0.05).

Economic constraints	Trained respondent (n= 100)	
	Mean score value ± SEM	Rank order
Complication involved in finance from bank	2.38± 0.10	I
Scarcity of money	2.06± 0.10	II
Lack of government subsidy in apiculture	2.00± 0.00	III
Lack of continuous income generation	0.42± 0.06	IV
High capital input in commencement	0.28± 0.05	V

In India only Khadi and Village Industries Commission (KVIC) supports for development of beekeeping industry with a view to uplift the financial status of people and popularizing modern beekeeping. In Nagaland KVIC penetration is negligible. Nagaland Beekeeping & Honey Mission (NBHM) supports beekeeping and provides bee box and equipment to the beekeepers but not finance. Trainees want to adopt beekeeping as an enterprise or as a side business but it require capital, whereas they are not able to invest money and start beekeeping. It requires sound financial investment which is difficult for the peasants to afford (Thomas *et al.,* 2002).A ramified fact came from banks; among the respondents 23 per cent were defaulters in the State Bank of Medziphema. Banks are not willing to provide finance for beekeeping, even to the trained ones without Gumbura (village chief) guarantee. Therefore, majority of trainees face problems for bank loans. It is

well known that per capita income of rural Naga people is extremely low therefore peasantry would not be able to afford beekeeping for entrepreneurship at its own input cost. Beekeeping provides income only during honey flow period and in case of Nagaland honey flow period comes only once in a year (Akum *et al.* 2012). This result corroborates with-technological and economic aspects and were prime constraints perceived by beekeepers (Kumar *et al.* 2013); lack of finance was also major constraint of beekeepers in Nigeria (Ebojei *et al.* 2008).

(ii) Technological

Data reveals that the technological constraint is the secondary hurdle of beekeeping. The technological constraints of trainees have been arranged in terms of mean score values (MSV) in ascending order. The majority of trainees broached relevance of new technology (MSV 0.98±0.09) as the most serious technological constraint and ranked first followed by lack of adequate scientific knowledge about apiculture, devotion towards traditional beekeeping, non-availability of scientific bee box and equipment and lack of knowledge of beehive products apart from honey was ranked fifth with MSV 0.54±0.08.

Table 3: Degree of seriousness of technological constraints of beekeeping

Technological constraints	Trained respondent (n= 100)	
	Mean score value ± SEM	Rank order
Relevance of new technology	0.98±0.09	I
Lack of adequate scientific knowledge about apiculture	0.94±0.07	II
Devotion towards traditional beekeeping	0.80±0.10	III
Non availability of scientific bee box and equipment	0.62±0.09	IV
Lack of knowledge of beehive products apart from honey	0.54±0.08	V

Nagaland beekeepers, beekeeping deal with indigenous honey bee *(Apis cerana)* and majority followed the traditional methods (Singh, 2014). Worldwide as well as India scientific community research more focused towards *Apis mellifera.* Naga beekeepers are more interested towards traditional bee box and traditional method (Singh, 2014). In India, not only in Nagaland, majority of beekeepers harvest only honey and few are wax also, whereas rest beehive products pollen, royal jelly, bee venom and propolis harvest was negligible. Therefore beekeeping in Nagaland is not a lucrative and this might be a lacuna of our training program. The prime constraints perceived by beekeepers were related to technological and economic aspects (Kumar et al. 2013).

(iii) Socio- psychological

The socio- psychological constraints exposed as tertiary constraint of trainees, presented in Table 4. The socio- psychological constraint issues of trainees have been arranged in terms of mean score values (MSV) in ascending order. Among socio- psychological constraints, majority of trainees found the fear of high risk in beekeeping as the most serious constraint (MSV 0.94± 0.08) and ranked first followed by fear of sting in beekeeping, perceived low outcome in beekeeping, unwillingness to come out of comfort zone, lack of motivation and lack of rapport with service providers was sixth ranked (MSV 0.54±0.03).

Table 4: Degree of seriousness of socio- psychological constraints of beekeeping

Socio-psychological constraints	Trained respondent n= 100	
	Mean score value ± SEM	Rank order
Fear of high risk in apiculture	0.94± 0.08	I
Fear of sting	0.88±0.08	II
Perceived low outcome	0.54±0.06	III
Unwillingness to come out of comfort zone	0.42±0.06	IV
Lack of motivation	0.20±0.05	V
Lack of rapport with service provider	0.14±0.03	VI

Naga beekeepers deal with *A. cerana* and this species is semi-domesticated in nature (Warrit, 2006), high swarming (Sharma, 1960); absconding in nature, therefore beekeeping with *A. cearna* is risky. Environmental temperature as an important clue for *A. cerana* absconding in Asia (Sakagami, 1960) and some external forces compel for absconding (Singh, 2000). Due to ferocious nature of honey bee, people are afraid of their sting. A. cerana honey productivity is lower than A. mellifera (Abrol, 2009). Beekeepers harvest only honey out of several beehive products, therefore beekeeping is perceived as a low outcome enterprise.

(iv) Marketing

Table 5: Degree of seriousness of marketing constraints of beekeeping

Marketing constraints	Trained respondent n= 100	
	Mean score value ± SEM	Rank order
Low price cost	1.34± 0.08	I
Lack of attractive packaging	0.56± 0.06	II
Lack of customer reliance on quality	0.36± 0.06	III
Lack of market for other beehive products apart from honey	0.20± 0.05	IV
Lack of marketing channel	0.16± 0.04	V

The marketing constraint is the quaternary constraint of trainees, depicted in Table 5. Issues of marketing constraints of trainees have been arranged in terms of mean score values (MSV) in ascending order. The majority of trainee respondents found low price of beehive produce (MSV 1.34± 0.08) was the most serious constraint and ranked first followed by lack of attractive packaging, lack of customer reliance on quality of honey, lack of market for other beehive products apart from honey and lack of marketing channel (MSV 0.16± 0.04) was ranked fifth. Price of honey at beekeepers' level is very less, all efforts of honey bees and beekeepers are evaluated at Rs. 130 to 250/ kg, which is extremely low. In Nagaland, beekeeping has not developed as an enterprise, therefore beekeepers do not make attractive packaging and do not follow the standard norms. The few miscreants might be adulterated honey due to which customers do not rely on quality of honey. The European Union banned honey imports from India in June, 2010 (Schneider, 2011). In Nagaland good marketing channel has been developed by NBHM, they setup number of collection centers for the purchase of honey from Nagaland. The buyers are also keen to purchase local organic honey. So their marketing channel is not a major problem.

CONCLUSION

The findings explicate and conclude in preceding paragraphs that the adoption of beekeeping is low in the first year, thereafter an increase in the second year and again a decrease in the third year due to various constraints. Overall complications involved in finance from banks, input cost beyond the trained peasantry and lack of government subsidy on apiculture were key constraints of beekeeping adoption. On the basis of inferences and experiences it may be concluded that the technological constraints and socio- psychological constraints may be solved by the adoption of apiculture with Apis mellifera. The rural area banks must provide loans easily for beekeeping as per their rural development ethics. The government should provide subsidy and fix the support price like food grains to encourage the beekeeping enterprises.

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