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A study on honey production and marketing in Behat region of district Saharanpur

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Abstract
The study was undertaken in Behat region, of district Saharanpur, Uttar Pradesh during 2019-2020. In this paper, we explain honey production and trade promotion in this region. The present study data were collected from primary sources of information. A total of 30 beekeepers personal interviewees were administered using structured and semi-structured questionnaires. This study analyses the future prospects of the beekeeping industry and the policy changes that are required to extend the honey market value in the same region.

Keywords: Saharanpur, honey, beekeeping, income, expenditure

Introduction
Honey bees are one of the nature's most exciting creations and are special gift to mankind that help man in several ways. Bees produce honey which is an agro horticultural product, generally sweetest, most nutritious natural food and has always been eagerly sought. Man understood the technique of domesticating the bees and rearing them in hives around 200 years ago. Since then, he has made innovation in its rearing techniques (Tej *et al*., 2017) [4].
India is account in one of the mega-biodiversity centres of the world for their wide diversity of flora and fauna. The enormous diversity of flora shows great potential in beekeeping. Indian has served a profound connection with beekeeping and honey processing since ancient times. After independence, the government of India introduced policy decision to revive various traditional village industries (Beula, 2020) [1].
The production of honey bee constitutes diverse value-added products including honey, bee wax, queen, bee colonies, and other products such as pollen, royal jelly, bee venom and propolis. These primary products play significant role in improving the economic growth in India. Additionally, beekeeping establish pollination services, assure high crop yields, helps in conservation plant biodiversity in natural ecosystem, and can be integrated with agricultural practices like crop production, animal husbandry & horticultural crops (Gezahegn, 2001) [3].
Thus, the objectives of this research are to study the honey production systems, determine productivity, identify apiculture potentials, and investigate the processing, marketing of honey in Behat, Saharanpur.

Materials and Methods
The present study is based on regular and repetitive surveys during 2019-2020 in different locations of tehsil Behat, district Saharanpur. The primary and secondary methods were used for data collection. For the primary data a personal interview, questionnaire and telecommunication were conducted, whereas for the secondary sources magazines, journals, books, newspapers, and research papers were consulted.
The data was collected throughout the whole town in different locations like Badshahibagh, Behat, Chikana, Fatehpur, Mirzapur, Muzzafarabad, Pilkhani, Qasimpur, Raipur etc. due to the presence of various apiaries.
The sampling and survey was started early in the morning usually commencing from 10:00 am to 4:00 pm. Every day, one survey site was taken into account and the whole survey schedule was lasted for one week. All samplings were done during sunny days. For each site, periodic surveys, personal interviews and sampling designs were taken to collect information on a seasonal basis.

Results and Discussion

Data for the present descriptive and analytical study has been collected from primary sources of information. The primary data are collected systematically through personal interview method. Out of 30 samples households interviewed, about 93.3% were male-headed and the rest 6.7% were female-headed. The average age of beekeepers, involved in honey production was 43.7 years old and remaining 33.3% of households were uneducated. The beekeepers were engaged actively in beekeeping activities with an average experience of 4.69 years. The family sizes of these beekeepers ranged between 4 to 11 and out of total households 6.6%, 86.6%, 3.3% and 3.3% were single, married, divorced and widower respectively. Bee keepings were practiced at both literate and illiterate level. The educational statuses of interviewed, 43.3% were illiterate, 30% can read and write, 16.6% attended junior and 10% of them went to secondary school.

Trends of honeybee products production in district Saharanpur

Respondents agree the trend of honeybee production in the year 2019–2020 has reduced for any one of a multitude reason. The sample of respondents indicate various reasons for decreasing trend of bee products such as shortage of bee forage, drought manifested with rain fall distribution, pesticide and herbicide applications, lack of water, poor management etc. (Table 1).

These respondents have assumed the increased trend of bee products due to increasing colonies, improving adoption of beekeeping practices and reducing afforestation. On the other hand, traditional, intermediate and modern hive perceived the trend to be constant respectively.

This survey concludes the honeybee products production was decreased due to shortage of bee forages, drought, pesticides and herbicide application, lack of water and poor management in Saharanpur district.

Table 1: Reason for decreasing trend of hive product and colony

S. No.	Problems	Percentage (%)
1	Lack of bee forage	12
2	Lack of water	15
3	Drought	12
4	Absconding	14
5	Pest and predator	5
6	Disease	4
7	Pesticide and herbicide application	9
8	Death of colony	5
9	Increase cost of production	7
10	Bad weather	10
11	Poor management	7

Annual Income

The beekeepers earn income from beekeeping and another source. Table 2 shows the annual income of beekeepers from honey and other sources.

Table 2: Annual income of beekeepers

S. No.	Annual income	No. of respondents	Percentage (%)
1	1,00,000 below	3	10
2	1,00,000-2,00,000	8	26.6
3	2,00,000- 3,00,000	12	40
4	Above 3,00,000	7	23.3

The above table cleared that out of the 30 respondents, 7 (23.3%) of the respondents belong annual income group of above Rs.3,00,000; 12 (40%) of the respondents are between the annual income group of Rs.2,00,000-3,00,000; 8 (26.6%) of the respondents are of the annual income group of Rs.1,00,000-2,00,000 and 3 (10%) of the respondents are below annual income group of Rs.1,00,000.

Annual Expenditure

Beekeepers met many items of expenditure in their life and unable to fetched the family income. Expenditure is varying from person to person; some of them spend the least amount while some have to spend more.

Table 3: Expenditure of the respondents for the year 2019-20.

S. No.	Annual income	No. of respondents	Percentage (%)
1	Below 5,00,000	3	10
2	5,00,000-1,00,000	9	30
3	1,00,000- 1,50,000	14	46.6
4	Above 1,50,000	4	13.3

Above table shows clearly the annual expenditure of beekeepers. Out of 30 respondents, 4 (13.3%) of the respondents spending annual expenditure of Rs.1,50,000 and above; 14 (46.6%) of them spending Rs.1,00,000-1,50,000. 9 (30%) of them spending Rs.50,000-1,00,000 and 3 (10%t) of them spending annual expenditure of Rs.50,000 or below.

Honey production and season

The amount of honey produced from one bee hive per year vary from place to place, which in most cases is determined by the presence of plenty pollen and nectar source plants. The maximum amount of honey harvested from frame hive was 20 kg and the minimum recorded from was 8kg. The honey production was increased through good management practices coupled with favourable beekeeping environment. On the basis of current study, the average amount of honey harvested frame hive was 13 kg per hive. The maximum production occurs during March (35%). Some beekeepers also produce honey during May and November, but the production is low.

Table 4: Honey production in different months

S. No.	Honey	Percentage (%)
1	February	31
2	March	35
3	August	20
4	September	14

Storage practices of honey

Most of the sample households do not store honey because of high demand for cash and lack of storage facilities. Generally, honey harvesting is done prior to harvesting of major food and cash crops; hence sales of honey provide immediate cash. Farmers use this cash to meet various expanses including fees and taxes and fertilizer loan. Whereas some beekeepers free from cash problems and stored honey for prolonged period for better price during off time.

More than 50% respondents sold their honey immediately after harvest and remaining sold after two to five months of harvesting time. Beekeeper lacking technical knowledge of honey storage resulted deterioration in honey quality.

Marketing of honey

Marketing is an important factor to buy and sell any product. The respondents choose different areas of marketing

according to their easiness and demand of product. Table 5 shows the areas of marketing of honey. Accordingly, 15 (50%) of the respondents sell their honey in the local area market, 10 (33.3%) of the respondents sell the honey within the same district, 3 (10%) of the respondents sell the honey within the different district and 2 (6.6%) of the respondents sell the honey within other states.

Table 5: Area of marketing

S. No.	Area of marketing	No. of respondents	Percentage (%)
1	Local Area	15	50
2	Within same District	10	33.3
3	Within different District	3	10
4	Within other State	2	6.6

Honeybee feeding

Bees store the honey for their own consumption during dearth period. This honey is harvested by beekeepers, which resulted honeybees starvation due to lack of feed. To overcome this problem, most of the respondents are providing supplementary feed for their consumption. The supplementary feeds are a mixture of sugar syrup, honey and water.

Despite of supplementary feeding, some other factors like availability of potential flowering plants and ample sources of water are required for honey production. Bee forage determines the amount of honey yield, the more bee forage resulting high honey production. In the study area, unimproved bee forage promotion was seen except to grow indigenous bee forage. The honeybee floras of the study area comprise trees, shrubs, herbs and cultivated crops and the species with their composition and population.

Pests and disease of honeybee

Honey bees are attacked by several pests and the existence of these pests is a major challenge to the honeybees and beekeepers. Based on the present study, the pests were identified such as ants, wax moth, bee-eater birds, spider, bee lice, termite, small hive beetles and snake. Nosema disease is the major destructive disease of adult bees, affecting workers, queens and drones alike. (Botías *et al*., 2013) [2].

Processing and Marketing of hive Products in district Saharanpur

Generally, the beekeepers believe that straining of honey improves its quality, and will be sold at high price, satisfies the consumer, comfortable during eating as well as produces high amount of beeswax. But in the study area, processing of crude honey into table honey and the crude beeswax into pure form is not being practiced by the beekeepers. Most of the farmers do not harvest beeswax but only few farmers do so from their apiary and used for candle light at home. The lack of knowledge how to be used, lack of processing skill how to harvest it, absence of demand in the local market and lack of processing material are served as the major reason of decreasing the honey production. The major product of beekeeping sold at Saharanpur market was honey followed by bee colony, bee hive and bee wax.

Conclusions

This study conclude the Behat region of district Saharanpur has adequate natural resources and culture of beekeeping. However, most beekeepers and local traders lack adequate financial resources to invest in the improvement of honey production technologies, storage, processing facilities, packaging and accessible to market. Beside the lack of beekeeping equipment and technologies, the agrochemical bee poisoning, shortage of bee forage, incidence of pest and diseases are other reason for decreasing the honey production. Most of the beekeepers follow traditional colony management, harvesting and processing methods to produce honey and most are not in use.

Yet, despite all the constraints and challenges, there are still enormous opportunities and potentials to boost the production and quality of honey products. There is a great need to pay attention in providing beekeeping equipments, minimizing the effect of chemicals with involvement of regional government to introduce developing strategies, and planting multipurpose and drought resistant honey bee flora, conservation of existing vegetation, integrating beekeeping with agro-forestry and crop production is important.

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