

Production and Marketing of Honey Prospects and Constraints- A Review

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(Received: 16 June 2023; Revised: 08 July 2023; Accepted: 24 July 2023; Published: 15 August 2023)

(Published by Research Trend)

ABSTRACT: Beekeeping is an environmental sustainable activity which could be helpful for increasing agricultural productivity. The purpose of the paper to highlight marketing prospects and constraints in beekeeping. Google Scholar and Web of Science were searched with key words such as honey production, honey marketing, constraints in beekeeping, bee products, buying behaviour of honey products etc. The reviews of different literature, research papers and data sources seeks find to discuss various benefits and use of honey, production and profitability of beekeeping, marketing of honey and constraints in bee keeping. Recent increase in consumer interest for healthy products has opened up new vistas for honey products because it's nutritional and medicinal properties. The review paper highlights the benefits of honey potential of beekeeping, constraints in beekeeping and consumer buying behaviour of honey product attributes. Lack of trained labour, low price in market, lack of working capital when required and low adoptions of modern technology are the important constraints in beekeeping.

Keywords: Beekeeping, production, marketing, constraints, buying behavior.

INTRODUCTION

Apiculture or beekeeping is the practice of taking care and management of honey bees for producing honey and wax. Beekeeping is also known as apiculture or meliponid culture (Cadwallader, 2011). Beekeeping is collection and retention of bees in a hive and apiary, or keeping a hive inside apiary and keep waiting for results from the bee colonies (Guyo *et al.*, 2015). Beekeeping is an environmental sustainable activity which could be helpful for crop production, animal husbandry, horticultural crops and conservation of natural resources (Gibbon, 2001). Indian bees are generationally familiar with the local fauna and flora so the pollination cover by bees is wider (Devidayal, 2023).

Beekeeping is done in two ways as stationary beekeeping and migratory beekeeping. Stationary beekeeping is a practice of keeping hives at one place on agricultural lands and in migratory beekeeping beehives are shifted to the places where there are flowers and the beekeeping is done (Velmurugan, 2022). Major types of manufactured honey include strained honey, ultra-filtered honey, pasteurized honey,

varietal or monofloral honey flavoured honey, infused honey, dried honey, honey sticks (Muhammad, 2015).

Beekeeping as entrepreneurship. Many research reported that beekeeping as entrepreneurial opportunity in rural region of the country. Advantage of beekeeping is that it provides self-employment. Production of honey, pollen, and royal jelly opens up avenues of entrepreneurship for rural youths in processing and marketing of bee products (Nath *et al.*, 2019). Honey provides opportunity for honey entrepreneurs for increasing satisfaction level of consumer. (Jaisy *et al.*, 2021). Farmers keep bees for extraction of honey for commercial purpose (Dia *et al.*, 2018). Beekeeping is a traditional honey-hunting and rural-based activity in developing areas (Guyo and Solomon 2015). Beekeeping has been given little attention and no responsibilities concerning towards the development of the sector has been assigned (Nyatsande *et al.*, 2014). Honey has a large potential market and the natural product can be used in manufacturing of soap, cream and salty snacks (Joshi, 2022). Self-employment in the hilly regions area like Uttarakhand state has started an initiative to give 80 per cent subsidy for beekeeping (Roy, 2020).

Table 1: Bee products.

Product	Study/ Author
Honey: Bee honey is composition of fructose, glucose and water, in different proportions and it also constitutes of several enzymes and oils.	(Rahman <i>et al.</i> , 2019)
Propolis and Bee wax: It is used for many reasons, as a beneficial and as a functional food additive. Bee wax is used in cosmetics.	(Freires <i>et al.</i> , 2016) (Andrade <i>et al.</i> , 2017)
Pollen and bee bread: Pollen is gathered by honey bees from flowers and packs these into granule having high nutritious value. Bee bread having several nutritional virtues.	(Kieliszek <i>et al.</i> , 2018)
Royal Jelly: It has an immune stimulatory and has been defined as “a secret of life”	(Kucharski <i>et al.</i> , 2008)
Bee venom: Bee venom is very beneficial for apitherapy	(Imai <i>et al.</i> , 2012)

Table 2: Benefits and use of Honey.

Benefits and use	Study/Author
Honey could be utilised for treatment of variety of ailments	(Tarunika, 2014)
Bees and beekeeping is advantageous for rural populations as it helps in setting up an alternative source of income with low input cost.	(Kumari <i>et al.</i> , 2016; Chikamai <i>et al.</i> , 2009)
Apiculture business is profitable and has helped in increasing individuals’ monthly income and could increase the income of the farmers.	(Esakkimuthu, 2017)
Beekeeping as a business is done mainly for pollination services, propolis and bee venom.	(Tej <i>et al.</i> , 2017)
Clinical trials have seen positive impact of honey for acne, herpes, skin rashes, psoriasis, and haemorrhoids.	(Burlando <i>et al.</i> , 2017)
Beekeeping has agricultural and health related benefits	(Shalini <i>et al.</i> , 2007)
Honey is mainly used for food and as medicine during the winter season	(Peter <i>et al.</i> , 2021)

MATERIAL AND METHODS

Well-known bibliometric information sources such as Scopus, Web of Science, and Google Scholar were searched with keywords such as use of honey, production and marketing of honey, benefits of honey, value chain of honey, constraints in honey production

and marketing were selected to obtain a large range of published studies. The secondary information and data was collected from various sources such as research papers, magazine, articles newspapers, annual reports and websites.

Table 3: Constraints in Beekeeping.

Constraints	Author/study
Middlemen earn large margins and inefficiency of honey market	Tizazu (2017)
Inadequate beekeeping equipment’s, high cost of modern hive, pests and predators, lack of training, shortage of water	Nebiyu <i>et al.</i> (2013)
Lack of trained labour, less knowledge of standardization, problems regarding, pests and diseases, very high price and less availability of latest beekeeping equipment’s for beekeepers in Ethiopia	Aman <i>et al.</i> (2019), Beyene and Marco (2014)
Honeybee pests and disease, less availability of beekeeping materials, Drought, death of colony, shortage of extension support required, marketing problems, shortage of bee forage, and inadequate skill and reduction of honeybee colonies.	Workneh <i>et al.</i> (2010)
Lack of extension services, poor access to latest technology, deforestation etc. are major constraints in honey production	Dereje <i>et al.</i> (2020) Gebrehaweria <i>et al.</i> , (2018)
Use of herbicides and pesticides on crops, pests, shortage of beekeeping equipment’, shortage of improved beehives, problem in migration, absconding, poor extension services, and death of bee colonies in Bale, south-eastern Ethiopia	(Bekele <i>et al.</i> (2017); Chala <i>et al.</i> (2013)
Shortage of qualified queen, lack of standards in beehives and materials, pesticide use, problems in selecting places, lack of proper advertisement of bee products to consumers and marketing problems in Turkey	Hasan and Suleyman (2009)
Honey adulteration, high cost of equipment and not much promising honey supply.	(Fred <i>et al.</i> , 2015) (Dereje <i>et al.</i> , 2020)
Majority of the beekeepers less working capital for beekeeping. attack of pest, predator and diseases and various internal and external constraints	(Suraj and Dhanjit 2018) Chala <i>et al.</i> (2012)
Less selling price of honey, huge expenditure on transportation and payments delay	Sumit <i>et al.</i> (2018)
Poor knowledge of beekeeping, lack of skilled labour, pests and predators, danger from pesticide on honey production, lack of infrastructure and poor research extension	Haftay <i>et al.</i> (2018)
Main constraints of honey production are ant attacks, poor adoption of modern beekeeping technologies and management practices, shortage of skill training, less utilization of apicultural resources.	Awraris <i>et al.</i> (2012) Onwubuya, (2013)
Drought, pests and predators and use of chemicals	Tewodros <i>et al.</i> (2015)
Major problem in beekeeping is refining of honey	Halil and Nurey (2007)
The major constraints of production of honey were price of hives, shortage of finances, cause of weather and shortage of flowering plants	Adedeji and Omoba (2016)

DISCUSSION

Production and Processing of Honey. If beekeepers work in collaboration, this will result in less transaction costs and bargaining costs (Rispe, 2015). Average production of honey from traditional beehives increased from 7.81kg to 8.30 kg per hive, the average production of honey from modern beehives increased from 9.38kg to 17.92 per hive. The growth of modern beehive is much higher than that of traditional beehives. This shows that the technical skill, knowledge and efficiency of honey harvesting from modern beehives are instrumented in increasing honey yield. There is increment in honey production which is having a direct link to better income and poverty alleviation (Nahusenay, 2015). Majority of the beekeepers check the colonies daily and only less of them (1.90 per cent) annually at the time of honey harvesting. Majority of the beekeepers (85.3 per cent) sell honey in local market in Eastern Zone of Tigray, Ethiopia. Huge potential of honey production and it is dominated by framed hive production system (Yetimwork *et al.*, 2014). Beekeeping sector is facing many problems related to quality, variety, mix harvest, sugar and residues. Average estimated production per colony was 16 kg in Turkey. Replacing selected queen bees, annual honey yield could be increased from 16 kg to 30 kg (Gamze *et al.*, 2004). Using high-pressure processing at ambient temperature the quality of honey is better (Noor and Mohammed 2013). Poor hygienic conditions while handling and storing raw honey leads to microbiological contaminations. Flawless managing systems for food safety will ensure less monitoring and controlled condition at various stages of processing of honey (Mihaela *et al.*, 2009). Production and quality of honey can be improved by transforming the beekeeping practices such as processing and marketing (Fikru, 2015). Honey harvested per hive per year from traditional hive was 5.6 ± 1.49 kg; transitional was 11.9 ± 3.15 kg and frame hive was 10.8 ± 2.91 kg, respectively in Hawassa city (Dinku and Bereket 2019). Annually production of honey per beehive ranges 4 to 17 kilogram, with mean production of 9.66 kilogram. Quantity of honey produced was positively related to coefficients of age, sex, income and household size (Michael, 2015). Bee population and breeding is good when climatic conditions and flora are good. The density in colonies showed regular growth during good flora (Dupont *et al.*, 2021). The average annual productivity of colony for modern was 8.64 ± 5.54 kg honey per colony per annum and average annual productivities of colony for traditional hive was 3.89 ± 2.52 kilogram honey per colony per annum (Shakib and Sayed 2016). (Famuyide *et al.*, 2014) studied the economics and production of honey in Oyo State and concluded that positive correlation between the education and productivity of beekeeping. Positive correlation between production of honey and rain, temperatures mean and speed of wind. The most suitable temperature for honeybees ranges from 25°C to 35°C (Schweitzer *et al.*, 2013). Average honey yield from traditional beekeeping systems was 7.20 ± 0.23 kg per year, average yield from transitional beekeeping

systems was 14.70 ± 0.62 kg per year and average production from frame hive was 3.38 ± 0.73 kg per year (Addis *et al.*, 2016). Honey yield per hive/year was highest for moveable frame hive. It has been recommended that beekeepers should use moveable frame hives to have growth in production of honey and in income also (Chala *et al.*, 2013). The average annual productivity of colony from modern hive was 8.64 ± 5.54 kilogram honey per colony per annum and from traditional hive was 3.89 ± 2.52 kilogram honey per colony per annum (Shakib *et al.*, 2016).

Profitability. Beekeepers obtained higher gross profits from improved beehives compare then traditional beehives per year was obtained in Chena district of Kaffa zone, Southern Ethiopia (Kassa *et al.*, 2017). The beekeeper that promotes and sells processed honey can earn good margins (Samuel *et al.*, 2017). The producer share is higher, when they sell directly to consumers. Thus, cooperative organizations which are involved marketing should focus on promoting improved beehives (Kassa *et al.*, 2017). Gross margin of honey collectors was 13.15 percent; gross margin of retailers was 15.32 percent. Honey is main income generating products next to farming (Amanuel *et al.*, 2017).

The overall cost of production of honey, fixed cost was nine thousand seven hundred, which is 30 percent of the overall cost of production of honey. The overall business of production cost of honey was Rs. 27,800 only (Musa *et al.*, 2014). The demand for Indian bee produced honey is huge in International market. To bring structural transformation in marketing of honey bee keepers should be interested in export of honey as it has great potential in international market. Fifty per cent of honey production in Romania is being sold out in international markets but still the profits are low because poor wholesale market (Pocol, 2011).

Marketing. Beekeepers should educate their consumers regarding positive healing effects and nutritional point of view of honey (Ikechi *et al.*, 2020). At different market points domestic price is higher than the export price, showing the impact of domestic honey marketing on export marketing (Sileshi *et al.*, 2019). Varied promotional tools are need for different generations of consumers (Sedik *et al.*, 2018). Strategies have been developed for honey marketing using concept of generation marketing. Beekeepers should conceptualize activities such as creation of event marketing, excursion to apiaries, observation hives, and honey festivals promoting honey as food in School. Community marketing is significant for Hungarian producers and distributors that can afford only limited amounts of market improvement (Ferencz, 2008). The main players in the chain were honey producers, rural assemblers, wholesalers, processors and retailers. Structure of the honey market has strong oligopoly in nature. To enhance volume of honey beekeepers training is required, agro-ecology is essential, education of household is needed, and size of livestock holding and number of modern hives are required (Samuel, 2017). Marketing margin analysis reveals that most of the profit was going to processors and variations in profit share across the value chain. (Ajabush and Motuma 2019). Establishing legal honey marketing framework

and regulatory measures are crucial tasks to create healthy honey marketing system (Sileshi *et al.*, 2019). The domestic honey market begins at the small beekeeper level, who sells most raw honey to collectors in the near town and village market (Sebsib and Yibrah 2018). Essential requirement for purchase of honey is quality, price, kind of honey and quality of package. Consumers buy honey mostly from supermarkets or from producers (Georgina *et al.*, 2009). There is difference among four age cohorts or generations regarding preference for honey, consumption and purchase behaviour (Sedik *et al.*, 2018). Majority of beekeepers get less price in the market by selling honey in raw form which leads to lower income and limits beekeepers to low production because less capital to expand their business. Beekeepers that processed the honey products get good price (Rispe, 2015). Abere and Lameed (2012) analysed of production, supply chain and marketability of honey in Ogun State. It is found that 40 per cent of beekeepers follow old method of beekeeping and 86 percent of beekeepers follow latest method of doing beekeeping. Ikechi *et al.* (2020) examined the socio economic characters of marketing of honey and to analyse profits of beekeepers. Found that 68 percent of the marketers were females. Beekeepers which opted contract scheme make more white honey which fulfilled the demands of processor, buyer and consumer. Contracting leads to better production because of good access latest technologies and skilled transfer (Abebe *et al.*, 2016).

Consumers buying behavior. Medical condition, quality of product, brand reputation and pricing are the major influencers of the buying perceptions of consumers (Steven *et al.*, 2013). Consumer opinions regarding quality of honey is related to taste (67 per cent), aroma (66 per cent) texture (64 per cent) (Monika *et al.*, 2021). While choosing variety of honey psychological and social determinants plays important role (Adam *et al.*, 2013). Mainly consumers prefer to buy honey whose brand, producer name and certification marks are displayed on packing. Awareness of the certification marks is must for consumers for making honey buying decisions. People tend to buy honey products directly from the honey producers (Titanilla *et al.*, 2020).

Consumers purchase honey from apiaries and open-air market. Major factor kept in mind of consumer at the time purchase was type of honey, price and colour (Iwona *et al.*, 2017). Major motivation to consume honey was taste of honey and the mind setup that it's a nutritious food (Svetlana *et al.*, 2019). Honey consumption satisfies various needs such nutritional food, well for health and good taste. Honey consumption in Romania is being associated with middle to highest level of welfare (Pocol, 2011). Main socio-demographic characteristics that affect consumer behaviours for honey market were gender, age, place of residing and income (Iwona *et al.*, 2017). The attributes like the environment and nutritional properties of honey has positive influence on the consumers' willingness to pay for local honey (Jelena *et al.*, 2020). Quality is the major challenge for consumer honey (Seth *et al.*, 2016).

Value Chain of Honey. Although value chains may vary across countries. The main honey value chain actors are input suppliers, producers/beekeeper, cooperatives, local collectors, wholesalers, processors, retailers, and final consumers of the product (Kassa *et al.*, 2017). Major share of honey goes to marketing through producer-collectors-wholesalers-retailer consumer. Network design model concentrates on quality of product and its effect on demand (Alireza and Sharma 2017).

The export performance of natural honey was shown increasing and upward trend of natural honey for past ten years. It was also concluded that there is a need for suitable export strategy. There is tremendous export potential of honey in India (Shilpa *et al.*, 2017). Beekeepers, middlemen and commercial processors dominate the honey value chain (Fred *et al.*, 2015).

CONCLUSIONS

Honey is consumed for nutritional benefits and medicinal properties. It has a beneficial effect on the immune system and contains nutritional compounds. The nutritional and medicinal benefits of honey are important motivational factors to consume honey. Many products derived from honey and use as health benefits. Besides beekeeping helps in increase the yield and productivity of the crops and lead to sustainable agriculture. Beekeeping provide source of income opportunity especially in rural areas. Beekeeping is a low investment business. It helps the rural youth to be self-employed. Use of herbicides and pesticides on crops, adulteration in honey, high cost of equipment and price fluctuation are some of important constraints in beekeeping.

Acknowledgements. The authors are the awardees of the ICSSR Major Research Project. This paper is essentially an outcome of the Research Project sponsored by the Indian Council of Social Science Research (ICSSR). However, the responsibility for the facts stated, opinions expressed, and the conclusions drawn is entirely that of the authors.

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How to cite this article: Khushdeep Dharni, Rakesh Rathore and Manveer Singh (2023). Production and Marketing of Honey Prospects and Constraints- A Review. *Biological Forum – An International Journal*, 15(8a): 407-413.