

Economic Potential of Beekeeping in Punjab

Sangeet Ranguwal

Punjab Agricultural University, Ludhiana, Punjab, India

*Corresponding author: sangeet@pau.edu

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ABSTRACT

Beekeeping is an age old tradition in India and is considered a no investment profit giving venture which can be practiced by all sections of the society. India with 133.2 thousand MT of production is 6th largest producer of honey with 3.74 per cent share in the world. The country is privileged with highest number of beehives (12.2 million) and is home to four of the seven known bee species. India also ranks 9th in export of honey. Around 50 per cent of the honey produced is consumed domestically and exports being dependent on one main market i.e. the United States (80%). Punjab is the leading state in the country in apiculture producing 18500 MT (13.89%) of honey from 4.0 lakh colonies and is exporting about 13,296 MT (1.91%) honey. The state has the potential to support even 10 lakh colonies that can be increased within next 4 to 5 years to achieve production of 45,000 MT with increased honey yield leading to increased net returns and profit. The major constraints faced by the honey producers include availability of technically skilled labour followed by low prices, high cost of migration, fear of theft and infrastructure. To develop an organised bee-farming sector there is a strong need to promote beekeeping as a subsidiary occupation by provision of adequate credit and subsidy on beekeeping infrastructure, establishing processing plants to give further fillip to honey exports, forming effective Breeders' Associations, fixing raw honey purchase prices along with initiative for the insurance policy for bee hives by the Government.

Keywords: Beekeeping, Constraints, Economics, Potential, Status

India is an agriculture based economy and about 55 per cent of its population depends upon agricultural sector. Agriculture sector involves a lot of money in the sense of investment in inputs while on the other hand, output received from it is not enough to meet the cash requirements throughout the year. So it becomes necessary for the farmers to adopt any side business to increase their income. Also, agriculture not only means the cultivation of land but also undertaking subsidiary occupations of farming for economic benefit. Beekeeping or apiculture is one such activity. Beekeeping is an age old tradition in India and is considered a no investment profit giving venture. It can be practiced by all sections of the society i.e. by men, women, grown up children and even by physically handicapped and old persons (Monga and Manocha, 2011). Keeping in view the

importance of beekeeping as part of the integrated farming system in the country and to provide a booster shot to sweet revolution, government approved the allocation for ₹ 500 crore for National Beekeeping and Honey Mission (NBHM) for three years (2020-21 to 2022-23) as a part of the *Atma Nirbhar Bharat* scheme.

According to bee experts at the Food and Agriculture Organization (FAO), one-third of the world's food production depends on bees. Animal pollination has proved to be essential for food production directly as well as indirectly; supply of human food and animal

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feed resources (Kumari, 2022). Of the total value of Indian agriculture, the share of animal pollinated crops is 32.74 per cent with 8.72 per cent being the direct contribution of insect pollination, besides spill over benefits of increased seed production, quality traits, breeding efficiency (Calderone, 2012) which unluckily are considered to be at risk (Palmer *et al.* 2004). Being entirely honey centric, Indian beekeeping lacks emphasis on pollination service and thus for stagnant Indian agriculture, this “micro concept” of using honey bees for planned crop pollination has the potential “macro-economic” impact (Chaudhary, 2017). Levin (1984) reported the economic benefits of bee pollination in USA at \$ 6 billion and the value of honey and beeswax produced at \$ 45 million only. Chaudhary (1999) provided estimated the economic benefits at ₹ 2997 crores from insect pollinators from 12 selected entomophilous crops annually while Chaudhary (1999) also quantified the incidental pollination gains from existing stock of honey bee colonies at ₹ 1470 crores. Keeping this in view, the present study plays a significant role to evaluate the present scenario of beekeeping and suggest steps to boost Indian and Punjab beekeeping.

METHODOLOGY

Secondary sources of data are used to analyze the status, economic potential and constrains related to bee-keeping in India. The comparative analysis

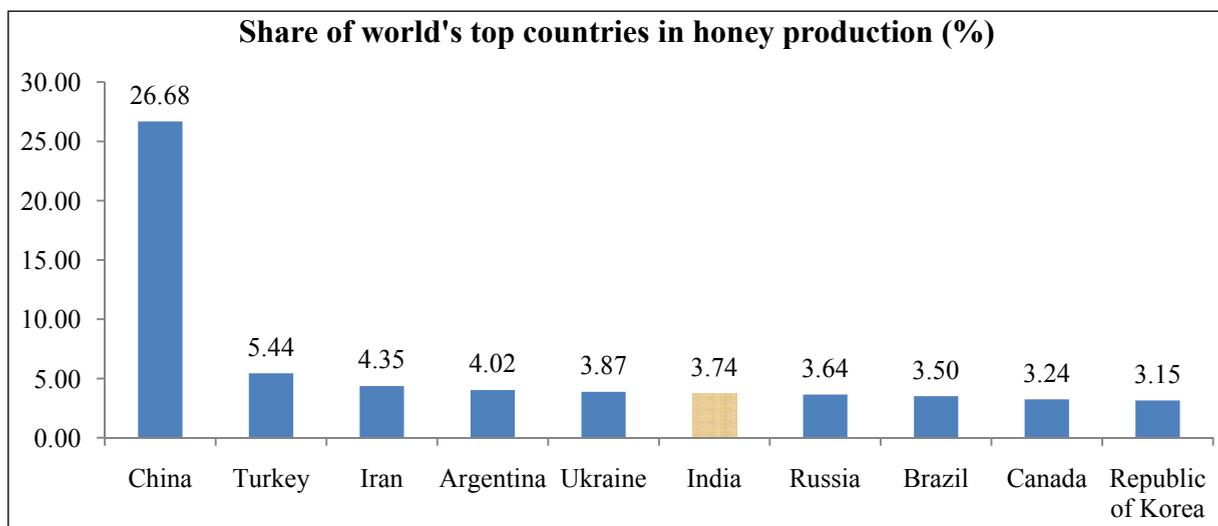
of honey production and exports has been done between India and other countries in the rest of the world. Further, the comparison of states within in India with relation to Punjab has also been done after collecting data from different secondary sources. The main sources of secondary data include websites such as Source: faostat.fao.org, indiastat.com, Department of Horticulture, Punjab and previous publications.

RESULTS AND DISCUSSION

Present status of beekeeping in India

Worldwide honey production amounts to 1.77 million metric tons (MT) with China, Turkey, Iran, Argentina, and Ukraine being the major honey-producing countries accounting for 44.36 per cent of total world production. India has traditionally been the leading producer of honey globally. Meanwhile, India with 66,280 MT of production per year is ranked as sixth largest producer of honey in the world contributing 3.74 per cent share in the world honey produced (Fig. 1).

As of 2020, India is the country with the highest number of beehives, at around 12.2 million, followed by China (9.21 million) and Turkey (8.2 million). Thus India with a potential of 12 million bee colonies can produce over 1.2 million tons of honey and about 15000 tons of beeswax (Sen and Thakur, 2004). The



Source: faostat.fao.org

Fig. 1: Leading producers of honey worldwide (2021)

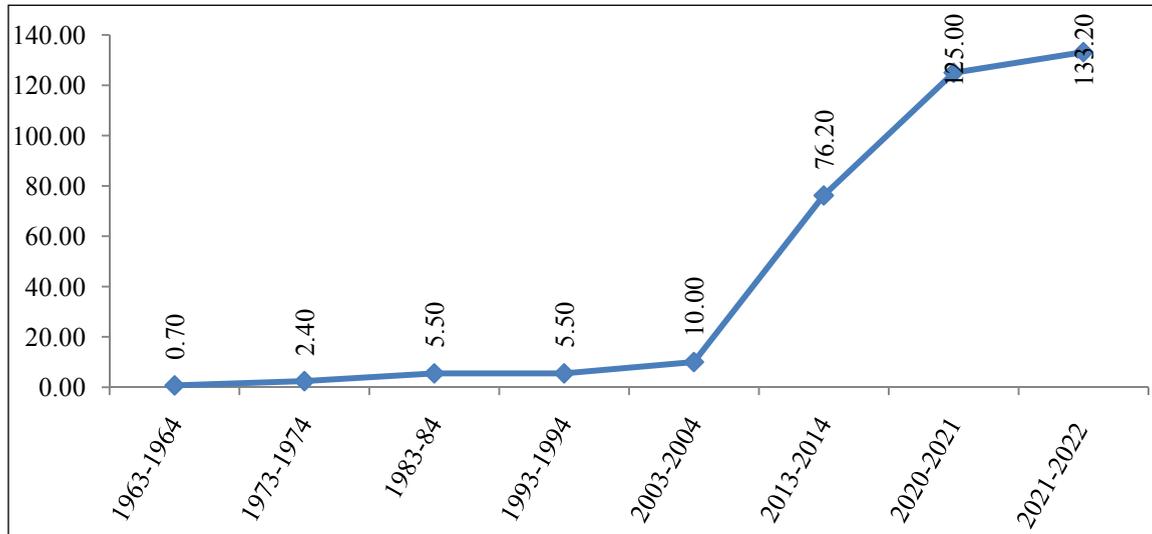


Fig. 2: Trends in India's honey production (in 000 MT)

net return of beekeepers rises with the increase in the number of colonies (Kumar 2012, Verma *et al.* 2018). India is home to four of the seven known bee species. Two of these are domesticated, *Apis cerana* (oriental honey bee) and *Apis mellifera* (European honey bee), and the other two are wild. Together these represent a wide variety of bee fauna that can be utilized for the development of the honey industry in the country. Honey production from all nectar sources, agricultural plants, wildflowers, and forest trees in the country in the year 2021-22 touched 1.33 lakh MT (Fig. 2).

The production of honey in India increased significantly towards the late 1990s. It increased from 0.70 thousand MT in mid 1960s to 5.5 thousand MT in mid 1990s, further to about 76 MT in the year 2013-14. This can also be attributed to the collective efforts of the beekeepers and the government.

Around 50 per cent of the honey produced in India is consumed domestically while the rest is exported across the globe. At present, India's natural honey exports are majorly dependent on one market - the United States, which accounts for more than 80 per cent of the exports (Table 1).

India exported 57.33 thousand MT of natural honey worth ₹ 668 crore during 2021 to top destinations Saudi Arabia, United Arab Emirates, Bangladesh, and Canada with the United States taking a major share at 44,88 MT.

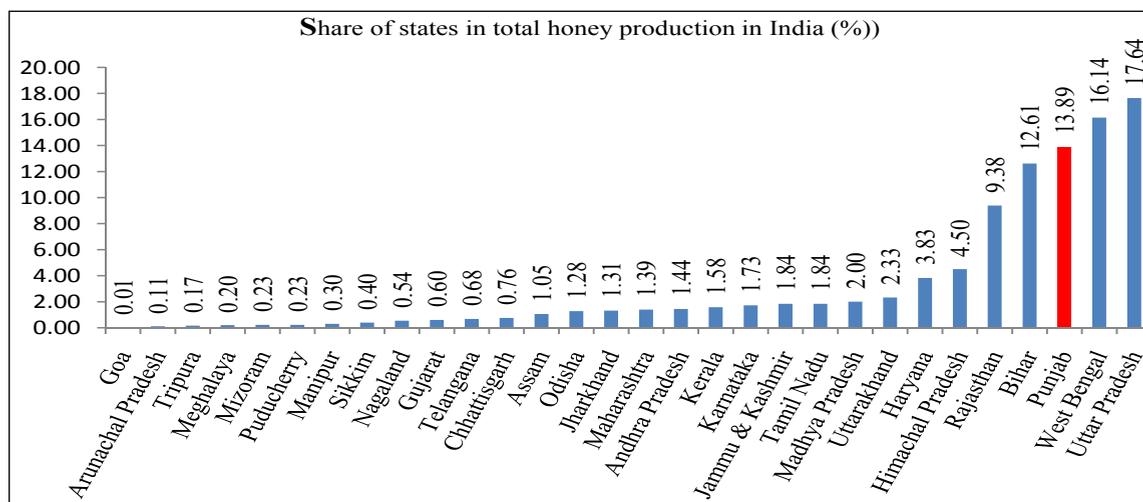
Table 1: Export of natural honey from India, 2021

Country	Export value (000 Indian rupees)	Export volume (000 metric tons)
United States	4,825.82	44.88
Saudi Arabia	490.13	2.98
United Arab Emirates	450.37	3.26
Bangladesh	156.50	1.10
Canada	155.69	1.09
Qatar	145.49	0.75
Nepal	142.99	1.29
Morocco	126.50	1.16
Yemen Republic	100.11	0.38
Kuwait	84.99	0.44
Total export to the top destinations	6,678.59	57.33

To further ease honey export, India is also renegotiating the duty structure imposed by various countries for boosting honey exports. APEDA is also helping the honey producers to access export markets besides availing government assistance under different schemes, quality certification, and lab testing. It is also addressing challenges such as higher freight cost and inadequate export incentives.

Present status of beekeeping in Punjab

Punjab is gradually becoming the promised land of diversified farming, as farmers are looking for ways to get out of the paddy-wheat cycle. Backed by expert



Source: indiastat.com

Fig. 3: State-wise production of honey in India (2021-22)

knowledge and marketing expertise, Punjab today accounts for a significant share in the total production of honey in the organised sector. The widespread bee floral plants and crops act as catalysts to the Punjab farmers to take a bow for the new revolution’.

Currently, Punjab is the leading state in the country in apiculture producing 18500 MT of honey from 4.0 lakh colonies which constitutes 13.89 per cent of the apiary honey production of the country (Fig. 3).

In Punjab, mostly multiflora honey is available. The average production of honey in Punjab is about 40 kg per colony. Punjab is exporting about 13,296 MT of honey.

State wise export potential in India

According to honey export data, Delhi is the largest contributor to honey exports from the country i.e. with 75.98 per cent value of the honey shipments to the global market, followed by Rajasthan (11%), Maharashtra (5.14%), Uttar Pradesh (4.60%) and Punjab (1.91%) as shown in the Table 2.

Table 2: Top states to export honey during 2017

State	Value (%)
Delhi	75.98
Rajasthan	11.00
Maharashtra	5.14
Uttar Pradesh	4.60
Punjab	1.91

Although Punjab is a leading state honey production, still there is an enormous scope for apicultural development. According to Department of Horticulture of Punjab, the state can support even 10 lakh colonies that can be increased within next 4 to 5 years to achieve production of 45,000 MT with increased honey yield per colony from the present level of 40 kg to 50 kg (Table 3).

With increase in number of colonies and production of honey, the state’s economy will also transform to have better income and employment opportunities (Table 4).

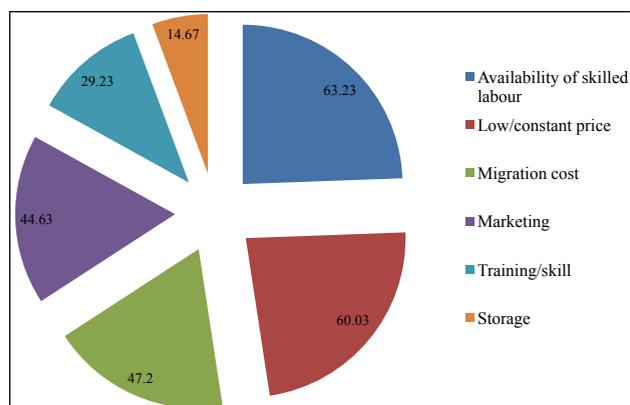
Employment generation

Another most important and invaluable contribution of honey bees is also in enhancing productivity of fruits, vegetables and field crops that signifies the potential of beekeeping in the state besides providing direct and indirect employment to 20000 and 40000 persons per year respectively.

Constraints in production and marketing of honey

Punjab has witnessed exemplary fast paced growth of beekeeping as an agro-based subsidiary occupation and also as the most important element of diversification in agriculture (Makkar *et al.* 2015). Various studies reported different types of constraints of Indian or Punjab beekeeping.

According to Kumar and Singh (2002) and Singh (2000), 60 to 75 per cent beekeepers have highlighted the problem of low price for bee products and marketing of honey (Fig. 4).



Source: Singh 2013.

Fig. 4: Problems/constraints faced by beekeepers in production and marketing of honey in Punjab

According to a study for Punjab, the main constraint faced by the honey producers was availability of technically skilled labour followed by low prices received which were almost constant. High cost of migration was another problem as the bee boxes were to be migrated in off seasons to other states/places. They also face problem of remote location in storing because of theft and infrastructure. Beekeepers also face difficulty in marketing of honey due to lack of knowledge regarding markets and branding. The beekeeping is restricted to honey production only due to lack of technical knowledge regarding harnessing the high cost by-products. Production of different bee products (pollen) from bee colonies, diversify the source of income of beekeepers and it mitigates the fluctuating effect of honey price in the international market (Hoover and Ovinge, 2018). There is a great need to train Indian beekeepers for extracting these bee products and even government of India also emphasize that beekeeping cannot

Table 3: Comparative potential of beekeeping in Punjab

Commodity	Yield per colony	Distribution of colonies (%)	Current Status	Future Potential
No. of colonies (lakh)	—	—	4.0	10
Honey (MT)	40 kg	90	18,000	45,000
Beeswax (MT)	800 g	90	288	720
Pollen (MT)	4 kg	25	400	1,000
Propolis (MT)	300 g	90	108	270
Royal jelly (MT)	800 g	5	16	40
Bee venom (Kg)	50 mg	90	18	45
Queen bees (lakhs)	200	5	40	100

Table 4: Comparative economic potential of beekeeping in Punjab

Commodity	Present status		Future potential (50 colonies)	
	Yield per colony	Price per kg	Yield per colony	Price per kg
Honey	40 kg	100	40 kg	100
Beeswax	800 g	250	800 g	250
Pollen	4 kg	200	4 kg	200
Propolis	—	—	300 g	1200
Royal jelly	—	—	800 g	3000
Bee venom	—	—	50 mg	—
Queen bees	—	—	40	200/queen
Total income	—	₹ 5000	—	₹ 51,000
Net income	—	₹ 2,50,000	—	₹ 25,50,000
Expense (50 colonies)	—	₹ 1,81,450	—	₹ 1,81,450
Net profit (Approx.)	—	₹ 68,550	—	₹ 23,68,550

Expenses include expenditure on migration of honey bees (₹ 94000 after 40% subsidy by the Dept. of Horticulture and other yearly expenses of ₹ 87450)

Source: Department of Horticulture, Punjab.

be restricted to honey and wax only because by-products like pollen, royal, jelly, propolis and bee venom can greatly help to Indian farmer to increase their income (PIB, 2019).

CONCLUSION

Sweet revolution is an ambitious initiative of the Government of India aimed at promoting apiculture for accelerating the production of quality honey and other related products. Beekeeping is a low investment and highly skilled enterprise in which technology application has emerged as a great enabler for socio-economic growth. The development of an organised bee-farming sector from local to high-tech apiaries can help scale up the sector and promote entrepreneurship. The development of cost-effective indigenous techniques can preserve and support bee conservation, prevent diseases or the loss of bee colonies and provide bumper quality and quantity of apiculture products. Good farming practices will yield superior-quality honey and other products for the domestic as well as international market. Research in the fields of beekeeping, bee-behaviour, etc., will increase the scope for commercial rearing of healthy bee colonies and apiculture products. The demand for organic honey in the international market could be leveraged for promoting organic beekeeping guidelines. Top trends in honey market include growing shift towards flavored honey; increased exploitation of wildflowers for honey production and corporate investment in niche products which need to be followed. For propagating the sector, the landscape for beekeeping and the species could be expanded on a commercial scale. Good quality breeding stock of honey bees to commercial beekeepers for higher production. It will also help attain Sustainable Development Goals of no Poverty, zero hunger, good health and well-being, and biodiversity and vibrant ecosystem along with gains in the international market to help double the farmers' income.

Beekeeping should be promoted as a subsidiary occupation and for this loans should be provided at low rate of interest for starting beekeeping in addition to farming to encourage more number of farmers to adopt it along with provision of adequate subsidy on beekeeping infrastructure. Beekeepers may also join hands to form effective Breeders'

Associations. Besides, processing plants should be established by the government to give further fillip to honey exports. Raw honey purchase price should also be fixed so that the exporters/wholesalers may not exploit the producers. The state government should also take the initiative for the insurance policy for bee hives.

There is a rising demand for food security in the face of threats posed by a growing human population. Proper pollination can improve the quantity and quality of fruits, nuts, oils, and other crops produced and bees as an insect play a crucial role in it. The development of an organized bee-farming sector from local to high-tech apiaries can play a significant role in this regard. Further there is a strong need to promote beekeeping as a subsidiary occupation. Thus, creating awareness regarding apiary, developing marketing facilities, trainings, making arrangement for availability of flora by road side plantation and easy credit facilities for rural people can have a positive impact on income enhancement and employment generation in rural areas.

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