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Apiculture Status in India: An Overview

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Abstract: In the world of sweet processing and trade, India is one of the world's leading manufacturer and exporter of sweet food. The change in sweet growing and trading in world affects Indian apiculture growth. This review summarizes the worldwide distribution and adjustment of the relative position of major production of honey, as well as the foreign market dynamics, in comparison with the comparative abilities of the key exporting countries of honey. This report analyses the opportunities and regulatory developments of the beekeeping industry for the future.

Keywords: Apiculture, Export, Import, Honey, Beekeeping, Beeswax, Bees hive

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Introduction

Apiculture is the cultivation and care of honeybees to extract honey from them. The management of the honey bee colonies or hives is beekeeping (or apiculture) (Basu, 1993). The honey-bee which is a social species live in big settlements of up to 100,000 individuals. An apiarist or beekeeper keeps bees for the collection of sweet honey and beeswax, or for pollination of crops. A bee garden is known as a beehive or "bee yard." Beekeeping means a scientific insect breeding process capable of producing honey and wax. Wax and other foreign materials are removed from honey for sweets production (Kumar and Sharma, 2014).

In the past couple of decades, honey intake has been growing steadily in India (Mattu, 2017). In

India, medical processing companies use honey greatly. The other major bee-colonial commodity – beeswax – is mostly used in the production of drug products, cosmetic soaps, etc. Honey cultivation has experienced enormous growth due to relentless efforts and devoted programmes such as the Honey Project in India. In 12 years, it has seen a 200% growth (Sivaram, 2004).

Advantages of beekeeping as an income generation activity:

- (i) Bee retention needs less spending in time, capital and infrastructure.
- (ii) The field with low agricultural values can be made profitable by beekeeping through

production of honey and bee wax. The honey bee is not competing with any other agricultural business for capital.

(iii) The ecological impacts of beekeeping is good. The production of sunflower and various fruits is increased as bees play an important role in the pollination of flowers.

(iv) The conventional hunting strategy is to destroy several wild colonies of the bees. The cultivation of bees in boxes and the production of honey at home will deter this from happening. The Honey is the most tasty and nutritious food. Individuals or groups may start beekeeping.

(v) Honey and wax demand is high.

Current development of Beekeeping sector, revenue growth, and employment opportunities:

According to the NBA, the honey production in India in 2017-2018 was 1.05 lakh metric tonnes (MTs) compared with the production of 35,000 metric tonnes (MTs) of honey in 2005-2006. In 2005-2006 India had 8 lakh bee colonies which now increased to 35 lakh colonies. In January 2019, number of beekeepers, beekeeping companies and honey societies increased to 9091. The export rate of honey by India is now 207 per cent higher. The Indian Government plans to establish an Integrated Beekeeping Development Centre in the 16 states, these are -- Andhra Pradesh, Tamil Nadu, Jammu and Kashmir, Haryana, Uttarakhand, Himachal Pradesh, Delhi, Punjab, Uttar Pradesh, Madhya Pradesh, Bihar, Manipur, West Bengal, Tripura and Karnataka (Marar, 2019). Significantly, the production rates improved through the fertilisation of honey bees on plantations (Verma *et al.*, 2018). Agricultural Experts claim that the yield obtained after pollination is 15 to 20 times more than the profits generated by hive products (Marar, 2019). According to the Indian government's survey, the large-scale beekeeping sector jobs are expected to produce three lakh man-working days through the establishment of 10000 colonies (Singh *et al.*, 2016, Marar, 2019).

Challenges faced by Beekeeping sector:

In the beekeeping practices, the destruction of honey bees due to dramatic climate changes can sometimes be challenging. In some parts of the world, nectar secretion has affected by winter as well (Singh *et al.*, 2016). Another major challenge facing the apiculture sector is bee-eater birds (a bird which eats honey bees) which are found in Himalayas. Due to severe cold in winters these birds migrate to Maharashtra and Andhra Pradesh. As a result, *Apis mellifera* bees were affected by Himalayan bee-eaters in these two states. This caused a major economic loss in crop yields as the pollination was decreased due to killing of bees by bee-eater birds.

The Indian beekeeping industry is led by the increasing demand by consumers for natural and nutritious foods. Increased customer understanding of the health benefits of honey use supports the Indian beekeeping industry. The increased number of users of Ayurveda leads to an increasing market for honey, a more natural substitute with many therapeutic advantages (Mishra *et al.*, 2020). Honey therefore, accounts for the biggest share of beekeeping in India among various types of products. Honey, particularly for dry skin, is the best moisturiser. Thus, manufacturers are adopting it to produce various cosmetic products. The increased demand for non-cruel, organic and natural cosmetic products would provide an additional boost to the development of the industry. South India is also the industry's leading regional sector (Crane, 1980).

Properties and Applications:

Beekeeping refers to natural honey production. A number of other by-products, including beeswax, propolis and royal jelly, and honeycomb, are also produced in addition to honey. The Indian demand for beekeeping was bifurcated to honey and beeswax.

Based on applications, the industry is divided into—(i) Direct Consumption, (ii) Food and

Beverages, (iii) Pharmaceuticals, (iv) Cosmetics and (v) Others.

Market Analysis:

The study addresses the largest regional markets in Indian beekeeping, namely North India, South India, East India and West India.

The Indian beekeeping market is led by increasing honey production in the region and increased customer demand for natural products. Raw honey is a folk medicine in the region as it offers a host of health benefits from ancient times. Due to the therapeutic advantages of honey and apiary, businesses like pharmaceutical, and personal goodness gradually embrace them in order to produce many kinds of products. The growing demand for honey in the Ayurvedic industry is projected to drive the beekeeping industry growth over the projected timeframe, with its healthy growth in the area (Thakur, 2014).

In addition, increased understanding of sugar use and its adverse effects on wellbeing drives demand for sweetness. In different dishes and food preparations, honey is used as an alternative to sugar. The sweetness found at grocery stores was pasteurised, the colour and taste of the sweet and the undesirable yeast is removed from it (Islam *et al.*, 2016). Manufacturers constantly improve their manufacturing methods to further increase the product's durability, which is supposed to help the business throughout the future. With their low costs, farmers choose beekeeping as a major subsidiary occupation. In addition, increasing government funding for honey production greatly lead to industrial development in the coming years in India by increasing marketing and innovation and exports. A detailed evaluation of the industry is made using Porter's five-power model and a **SWOT** study in the extensive EMR survey. The EMR report deals with both the industry's macro- and micro-dimensions. It also evaluates the industry's core price and demand metrics (Thakur *et al.*, 2016).

Bees disappearing everywhere:

Ominous reports have been published around the world, at least since 2006, of bee colonies which seem to collapse without cause. There has been growing reports of species loss in recent decades, but the case of bees has especially worrying repercussions on human life. Bees are pollinators and they are transferring pollen from plants to plants and so they are helping in fertilization of plants. While staple plants like paddy and wheat auto-pollinate, many fruits and vegetables depend heavily on external pollinators like bees. The productivity of some plant species can be decreased by as much as 80% without these pollinators (Tej *et al.*, 2017).

What's buzzing bees in India:

Scientists have documented various facets of the decline, including higher levels of oxidation in wine bees exposed to pesticides in conjunction with local field workers (Bayissa, 2006). Land with lower use of pesticides has an increased diversity of bee species. Bees subjected to pesticide lost their sense of smell as a result of antenna warping and could not return to their hives, thus causing hunger and collapse of the hive as a whole. With the use of pesticides in the last four- to five decades, these improvements must have occurred (Thakur, 2014).

Government interventions effective?

It is sufficiently imperative that pollinators and their depletion be tackled by the central and various state governments (Bayissa, 2006). They do this not only by encouraging further studies on how bees are influenced by contemporary industrial agriculture, but also by fostering beekeeping in order to increase the incomes of farmers. The government is promising to increase crops productivity with bee pads and farmers can also benefit from the sale of the honey produced by these bees (Goyal, 1990).

Non-indigenous bees are being promoted by the Union and the governments of the State,

Mainly *Apis mellifera*, the western European bee that has become popular for their honey production and is less likely to swarm. *Apis dorsata* (rock bees) or *Apis ceranaindica* (Indian hive bees) have declined because the government promotes *Apis mellifera* (Nair, 2003).

Holistic solution possible?

Apiculture may not be the systemic solution to the problem of pollination in India. Urbashi Pradhan is a conservation biologist affiliated with the Ashoka Trust for Environmental Research, which investigates how forest fragments play their part in habitats and lives of individuals beyond Sikkim's protected areas. Part of her research is the importance of pollinators, including not only bees but other species, such as flies, in the environment (Mishra *et al.*, 2020).

Since Sikkim prohibits pesticides – the state has recently become fully organic – the pollination issue in Sikkim here is not the same as in other parts of India. Sikkim has tried to promote *Apis mellifera* Africanised subspecies. However, it underlines another major challenge. If a single species has an artificial numerical superiority, it could be lost by others fighting at the same place in the ecological niche to reduce total diversity.

Market Outlet:

India exported 38177.08 MT of honey in 2016 to countries such as United States of America, Bangladesh, Morocco, Saudi-Arabia (Garware *et al.*, 2018). At present, the market grows at about 15%. The honey market is steadily expanding at 30–40%, and expansion is possible with consumers turning to healthy eating choices. The intake per capita of honey is still very poor in India (50 g/year) whereas globally it is 250–300 g (Marar, 2019). In Germany it is 2 kg/year.

Based on the consumers' demand for natural and safer alternatives to artificial sweetener, the understanding of the benefits of honey over granulated cane sugar and anti-inflammatory properties, the world market for honey is expected to expand to 2.4 million tonnes by 2022.

The future demand development will be motivated by both the use of honey for food and non-food. The need for honey would be increased to be used in a variety of home treatments including weight loss, better metabolism, help for prebiotic, acne healing, exfoliation etc. (Basu, 1993). Recently, Silalahi *et al.* (2021) reported that the administration of honey with a dose of 0.6% is effective in improving the feed conversion ratio, increasing feed efficiency, daily growth rate, body weight gain, and reducing the amount of feed consumption of freshwater pomfret in inundated peat fish ponds.

Honey as a primary ingredient in most food recipes, would profit in the food industry from the efforts of producers to create all-natural, organic, reduced sugar, low calories foods and drinks (Tej *et al.*, 2017). Asia-Pacific is the biggest and fastest expanding region with 5.2 per cent Compound Annual Growth Rate in terms of population growth, increased understanding of the medical impact of honey, and consequent increases in sweet diets, increased spending on healthcare and increased popularity of preventive medical treatments. Punjab has an annual average honey production of 35 kg per colony per year with a maximum of 80,000 bees.

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