

SWEET REVOLUTION A BOOM IN HONEY PRODUCTION



Sweet Revolution is an initiative of the Government of India, which is aimed at promoting apiculture, popularly known as 'beekeeping', for accelerating the production of quality honey and other related products. Beekeeping is a low-investment and highly-skilled enterprise model, in which technology application has emerged as a great enabler for socio-economic growth. To provide a booster shot to Sweet Revolution, the Government launched the National Beekeeping and Honey Mission, for the overall promotion and development of scientific beekeeping in mission mode.

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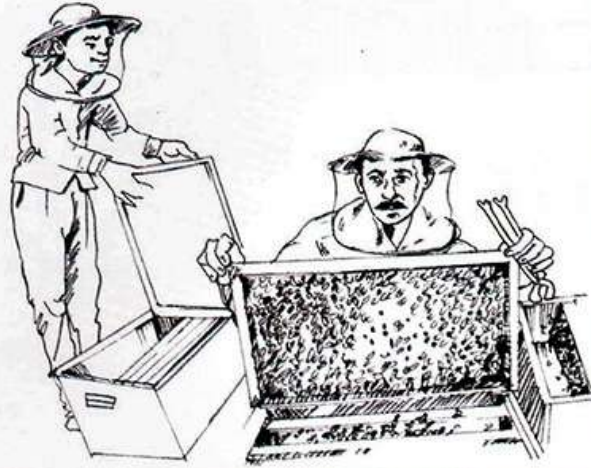
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India has witnessed the exemplary fast-paced growth of beekeeping as an agro-based subsidiary occupation. In India, beekeeping is practised in mountains, foothills, forests, agricultural lands, mangrove forests, etc. The technique involved in beekeeping varies from region to region. The main harvest is from *Apis dorsta*, *Apis cerana*, and *Apis mellifera*. *Apis mellifera* was successfully introduced in the Northern and Eastern plains of India. Management technology schedules have evolved for specific locations in the country. The emphasis is given in

the context of changing conditions of vegetation and climate. Besides the seasonal management for each agro-climatic region, suitable management technologies have been adopted to improve colony productivity and the production of honey, beeswax, pollen, royal jelly, etc. Today, beekeeping is an important, sustainable, and integral agricultural activity under the rural development programme in India since it provides nutritional, economic, and ecological security and balance. The knowledge of agro-climatic conditions, the diversified flora, the changing agri/horticultural pattern of the crop, the



colonies found in nature. The idea to keep bees in log hives has been reported to have come from fallen trees that were nested by cavity-nesting bees. The development of modern beekeeping has its origins between 1500 and 1851, when many attempts were made to domesticate bees in different types of hives but were not successful

types of bees, the management practices, etc. play a pivotal role in transforming the beekeeping industry in the country.

Apiculture is the practice of keeping and managing honeybees for the production of honey and other related products. Honey is a natural sweetener that has a variety of health benefits. The product is also used for manufacturing other products, such as beeswax, royal jelly, propolis, and pollen. The components of apiculture include bee colonies, beekeepers, beekeeping equipment, and the products produced from the bee colonies. Bees also play a crucial role in pollination, which is essential for growing crops and fruits. In comparison to other forms of agriculture, apiculture requires less land and water and has a lower carbon footprint. Bees are accommodated in artificial hives where they live comfortably within easy reach of the beekeeper for examination and extraction of surplus honey, after keeping sufficient in the combs for the bees. Honey is a product of bees, which gather sugar-containing nectar from flowers. Honey should be processed as soon as possible after removal from the hive. Honey processing is a sticky operation, in which time and patience are required to achieve the best results. Careful protection against contamination by ants and flying insects is needed at all stages of processing. Several small-scale industries depend on bees and bee products.

History of Beekeeping

Primitive people used to rob bee colonies found in the cavities of hollow trees, on rocks, and in traditional mud houses, and this is still being followed by some tribes. There was no development in beekeeping until the 16th century. Proper beekeeping started only when man started giving protection to

because bees attached their combs together as well as to the walls of the hive, and the combs required had to be cut for honey. The discovery of the principle of bee space in 1851 by LL Langstroth in the USA resulted in the first truly movable frame hive. This was followed by subsequent innovations like the comb foundation mill, honey extractor, smoker, etc., which helped in the development of modern beekeeping we see today.

Beekeeping in India

In India, the first attempt to keep bees in movable frame hives was made in 1882 in Bengal, and then in 1883-84 in Punjab. In South India, several beekeepers were trained during 1911-1917, and a hive for the indigenous bee *Apis cerana* was devised based on the principle of bee space. Beekeeping was also started in the then Travancore State in 1917 and in Mysore in 1925. In Himachal Pradesh, modern beekeeping with the indigenous honey bee *A. cerana* started in 1934 at Kullu, and in 1936 at Kangra. The exotic bee *A. mellifera* was successfully introduced for the first time in India in 1962 at Nagrota Bagwan (then in Punjab and now in Himachal Pradesh) because this bee has the potential to produce more honey. At present, both hive bee species are being used in modern beekeeping, and a lot of honey is also being collected from the wild bees, viz. *A. dorsata* and *A. florea*. India produces approximately 70000 metric tonnes of honey annually from all four species of honey bees.

Honey is rich in nutrients and antioxidants, has antibacterial properties, and can play a role in diabetes management as part of a balanced diet. The product also has several potential health benefits and plays a role in many home remedies and alternative medicine treatments. Apart from being

delicious, there are other ways raw honey is good for everyone. Beekeeping is a significant, sustainable, and environmentally sound activity involving the integration of forestry, social forestry, and Agricultural supporting activities since it provides nutritional, economic, and ecological balance while providing employment and income. India has good potential for beekeeping and to become a major honey-exporting nation. Honey production provides a sustainable income source, requiring only low-cost investment and using the natural resource base. Honey is among the most popular and widely used sweeteners, with enormous health benefits. Besides, it is used by several cultures around the world as a base for many traditional medicines, especially in Ayurveda.

The major geographical regions facilitating beekeeping development are classified into the Southern peninsular region, the Northeast region, Indo Gangetic plains, and the Northern Hill region.

Sweet Revolution

Sweet Revolution is an ambitious initiative of the Government of India, which is aimed at promoting apiculture, popularly known as 'beekeeping', for accelerating the production of quality honey and other related products. Beekeeping is a low-investment and highly skilled enterprise model, in which technology application has emerged as a great enabler for socio-economic growth. The demand for good quality honey has grown over the years as it is considered a naturally nutritious product. Other apiculture products such as royal jelly, beeswax, pollens, etc., are also used extensively in different sectors like pharmaceuticals, food, beverage, beauty,

and others. Scaling up beekeeping will increase farmers' income, generate employment, ensure food security and bee conservation, and increase crop productivity and pollination. To provide a booster shot to Sweet Revolution, the Government launched the National Beekeeping and Honey Mission, for the overall promotion and development of scientific beekeeping in mission mode.

Government Initiatives

The Prime Minister called upon a farmer's gathering on 17 September 2017 at Amreli (Gujarat) to take up honey farming at a massive scale to bring 'Sweet Revolution' in the country along the lines of the White and Green Revolution. Keeping in view the importance of beekeeping and achieving the goal of 'Sweet Revolution' the need for holistic development of beekeeping was felt. Accordingly, a new Central Sector Scheme National Beekeeping and Honey Mission (NBHM) for the overall promotion and development of scientific beekeeping and production of quality honey and other beehive products is approved by the Government of India. The scheme is being implemented through the National Bee Board as a Central Sector Scheme (100% funded by the Govt. of India). The main objective of the National Bee Board (NBB) is the overall development of Beekeeping by promoting Scientific Beekeeping in India increasing the productivity of crops through pollination and increasing honey production for increasing the income of beekeepers/farmers.

The National Beekeeping and Honey Mission (NBHM) is having following Sub-Schemes/three Mini Missions-

- A. Mini Mission-I:** Under this mission, the thrust will be given to the production & productivity improvement of various crops through pollination assisted by the adoption of scientific Beekeeping;
- B. Mini Mission-II:** This mission will concentrate on post-harvest Management of beekeeping and beehive products including collection, processing, storage, marketing, value addition, etc., with a thrust to develop requisite infrastructural facilities for these activities; and
- C. Mini Mission-III:** This mission will concentrate on Research and Technology generation for different regions/States/Agro-climatic and Socio-Economic conditions.



The NBHM will work in coordination with other Governmental programme and scheme relating to the promotion of beekeeping, viz., MIDH RKVY, Honey Mission of WIC, MSME, NLRM/SLRM, M/o rural development, M/o EF&CC, M/o Tribal Affairs, M/o Commerce & Industries, AYUSH, ICAR, etc., for overall promotion and development of scientific beekeeping in the country. It will provide technical guidance/advice and administrative support to the implementing agencies at the National and State Levels for an effective and smooth implementation of the scheme. Concentrated efforts through NBHM increase honey production by about 1,33,200 Metric Tonnes as per 2021-2022 and advanced estimates. India has exported 74413 Metric Tonnes of natural honey to the World, worth Rs 1221 crore during 2020-2021. As a result, India is among the world's top five honey producers. The Madhu Kranti Portal for ensuring the source of honey was launched in April 2021. It's a result of the best implementation of NBHM. More than 10,000 beekeepers and honey societies/farms/companies with 16 lakh honey bee colonies are registered with National Bee Boards and linked to the Madhu Kranti Portal.

Till now, 16 integrated Beekeeping Development Centres (IBDCs) & 3 regional honey testing labs (at IARI, New Delhi, IHR Bangalore IIVR, Varanasi) and 28 mini labs in the different agroecological regions have been established. ICAR, New Delhi, also promotes location- and situation-specific research on important issues through all India-coordinated research projects on honey bees and pollinators (26 centre spread over different agro-ecological regions of the country).

The scientific technology is being adopted for increasing production and testing of honey



by maintaining quality standards for National and International markets and promoting the production of other beehive products, viz., bee pollen, bee bags, royal jelly, propolis, and bee venom. This has facilitated the beekeepers to increase their income and increase demand for honey and beehive products both in domestic and international Markets.

Technology Application

The intervention of technology in bee farming will help scale up the sector and promote entrepreneurship. The development of an organised bee-farming sector, from local to high-tech apiaries, can play a significant role in this regard. IoT, AI, mobile sensors, and smartphone apps can help beekeepers raise healthy bee colonies and extract quality honey and other products. Algorithm-based predictive models could be designed for commercial beekeepers to provide operational support for large-scale apicultural practices. The development of cost-effective indigenous technology that enables farmers to raise healthy bees on farms and assess their hive fitness through sensors or cloud information can also be introduced to this sector. Technology will preserve and support bee conservation, prevent diseases, or the loss of bee colonies, and provide bumper quality and quantity of apiculture products. Hi-tech apiaries for commercial bee farming will lead to the manufacture of high-volume marketable products. Good farming practices will yield superior-quality honey and other products for domestic as well as international markets. Research in the fields of beekeeping, bee behaviour, etc., will increase the scope for commercial rearing of healthy bee colonies and apiculture products.

Over the years, the traditional beekeeping business has evolved in terms of technology. One example is the usage of the 'super' chamber for extracting honey. We can take around 70-80 kg of honey from a single hive if we use the super chamber. Usual hives without the super chamber yield only about 10-15 kg. There is also a new queen bee-rearing technology.

An organised and tech-driven bee-farming sector is an excellent way to generate employment opportunities, through skill-building projects. It will also help attain Sustainable Development Goals 1 (No Poverty), 2 (Zero Hunger), 3 (Good Health and Well-Being), and 15 (Biodiversity and Vibrant Ecosystem). □