

# Review of Past Literature of Honey Beekeeping and Its Production in Rural Area of the World

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## Abstract

Honey beekeeping is the rearing of honey bee for honey and other by products. Honey is an essential element of food of human being. This business is in a full swing in the world. Seeing to its importance the study was arranged in 2018. The major objective was the past review of literature of honey beekeeping and its production in rural area of the world. So many researchers have done work on this topic while purposively 30 studies were selected and reviewed each study 15 times and analyzed the situation. The result indicates that honey beekeeping is a very useful occupation in the rural area of the world which play key role in generation of employment and alleviation of poverty in the world. However it supplies nutritional and ecological security to the rural communities at the household level. Honey beekeeping play key role in pollination and enhancing the agriculture production. This business provide honey and other by products to the world community which is essential element for health development of human being. The cost on this business is very small and everyone can start this business easily in the world without more money. The study further indicates that *Apis Mellifera* give more production than the other species of honey bee in the world. Among top ten countries China was found number one while New Zealand number 10 in honey bee production in the world. The major constraints and problems in beekeeping were the expensive inputs, pest attack, lack of modern production, rearing techniques, marketing skill, trainings and credit facilities by bank. On the basis of problems the study recommend new honey beekeeping institution construction in the world; Training center for skill improvement is demanded; Transportation and marketing facilities are essential for development of this business in the study area ; Credit facilities on low interest rate should be provided to honey beekeepers for development of honey bee production in the study area. Bee flora flower plants multiplication for enhancement of honey bee rearing is requested.

**Keywords:** Review of Past Literature, Honey beekeeping, Production. Rural Area of the World

## 1. Introduction

A beekeeper keeps honey bees to collect honey and bee wax, to pollinate crops or to produce new honey bee colonies for sale to other beekeepers. The person who rear honeybees is known as beekeeper or apiarist and the location where honey bees are kept is called apiary or bee yard. This is concerned with the practical management of the social species of bees, which can live in large colonies of up to 100,000 individual bees. Honey bee keeping is the management of honey bee for production of honey, beeswax and other bee products for personal and commercial purpose. It has more than 20,000 species, some live in solitary form while some live in groups. All species honeybees are capable of interbreeding and hybridizing which then quickly spread around the world. In Pakistan the honey bees has four species, namely *Apis Dorsata*, *Apis Cerana*, *Apis Florae* and *Apis Mellifera*. Honey is an important nutritive and readily digested food containing sugar, protein, free amino acid, minerals, trace elements, enzymes and vitamins with a fairly high caloric value. Fructose, glucose and dextrose are directly absorbed into the blood and provide energy to the body. Honey also contain tiny amounts of several compounds which act as antioxidants. These includes such as Chrysin, Pinobanksin, Vitamin-C, Catalase and Pinocembrin. The specific composition of any honey depends on the flowers available to the bees that produce the honey. On the basis of floral sources the honey may be blended, poly floral, mono floral , honeydew etc. The Ph of honey is commonly between 3.2 and 4.5(Bredbear, 1990,2009). However children less than 12 years and old population of age above 50 years are considered to be the target for honey and honey products. People of all age use honey, however as it is an expensive item, low purchasing power of general consumer in Pakistan sets limit to the potential market for honey. The overall demand of honey for industrial use is 90 percent fulfilled by farm honey suppliers from Punjab and Khyber Pakhtunhwa, whereas remaining demand is covered by wild honey from Federally Administered Tribal Areas(SMEDA- Sindh, PREF-19/June, 2007/Rev1). Yet Pakistan has not been able to export honey and its products on large scale because it is not self sufficient in this field. Depending on the part of the country environment, quantity and quality be bee forages, quantity and quality of honeybee colony, typical colony of the species. A mellifera bee can produce 15-25Kg honey and 4.3-8.16 Kg of pollen in an average year. Besides selling honey and other bee products, such as beeswax, pollen, royal jelly, proposal, bee venom or queen, beekeeper can also provide pollination services(hive rentals) to farmers and Orchardists(Admin, 2011).

Beekeeping is the, important component of agriculture and rural development. It provide nutritional, economic and ecological security to rural communities at the household level. It is an additional income generating activities. This being a non land based activity which does not compete with other resources in the area.( FAO, 1990). It helps the human life through a variety of assets. Bees feed on nectar and collect pollen from the flowers, then the nectar is converted into honey with the help of different enzymes. Gums and resins are collected from the secretions of plant or injured part of the plant which are used for capping filled, unfilled cells and nest making. Bees are the only livestock which does not compete with other animals with the capacity to harvest nectar and pollen (Lamessa, 2007). Similarly beekeeping enhances the productivity of crops through the process of pollination and have significant role in ensuring food security. The contribution of honey bees in crop pollination is 80%. It improves the quality of fruits, vegetable and yield of seed crops. Beekeeping in Pakistan are maintaining a large number of honeybee colonies and are capable of providing honey, royal jelly, pollen, propels and beeswax. The production and value addition of by products would supplements the income of beekeepers in the future (Ashfaq, 2006).

Subsequently beekeeping requires very little capital for start up; little and less labor and can easily be practiced by men and women, Youth and people with disabilities alike. This means that beekeeping provides an opportunity for different members of the community to use available resources to support their livelihoods. Women can easily adopt this profession as an income generating activity, as it does not require big investment or infrastructure. The best and favorable time for beekeeping and production is from October to November and spring seasons, however honey can be produced throughout the year by planting special species of bee flora plants and moving colonies to different natural floral belts in the country while looking at major honey markets and honey demand. Karachi is considered to be the biggest urban market which consumes about one third of the total population. However, it is not possible to say as to how much is supplied to industrial user(Pharmaceutical Companies), What quantity is further shifted to interior Sindhi and what volumes are left for the retail users( SEMEDA- Sindh, Pref-19/Jun, 2007/Rev1). In the world top ten production countries are namely China, Turkey, United state of America, Iran, Russian Federation, India, Mexico, Brazil, Ukraine and New Zealand (<https://www.trendrr.net/6124/top-10-largest-honey-producing-countries-world-famous-best/>). There the situation is the same as in Pakistan. Beekeeping generates employment and income to rural community of the world and plays a role as essential food for human being. Seeing to its importance the present study was arranged to review the past literature of honey beekeeping and its production in the rural area of the world.

## **2. Materials and Methods**

Honey bee keeping is an useful activity and play key role in income generation. The main focus of the study is the rural world. Purposively 30 past studies were selected and reviewed in depth and analyzed the situation about honey beekeeping and its production in the study area and conclude the result.

## **3. Past Literature Review of Honey Beekeeping and its Production**

Clauss, B (1983) investigated that due to insufficient rainfall the growing of agriculture crops in many part of the world is impossible and there the options of livelihood is limited. He told that beekeeping is an alternative source of income generating activities for improving the life standard of the rural communities. Oluwole(1999) clarified that due to less investment modern beekeeping is an easy activity for income generation . Beekeeping is an agricultural and forest based decentralized industry and does not displace person from villages. It is a sustainable form of agriculture which solve the problem of finance and nutrition which play also important role in the enhancement of yield of agricultural products. Muzaffar (2000) analyzed that the improved beekeeping practices of the honey bee species of *A. Melilifera* and mobilization of the communities of honey bee increased honey production compared to *A. cerana* in Pakistan. However adoption of training and mobilization can generate income and employment which alleviate the poverty and decreased the migration in the study area. ARSD and Gezahegen (2000,2001) study reflected that honeybee keeping is a non-farm activity which contribute to the incomes of the household and to the economy of the nation in the rural area of Pakistan They provide honey, queen bee, formation of new bee colonies for sale to the other beekeepers and by products such as beeswax, pollen, royal jelly, bee venom and propels in cosmetics and medicines. BSCIC (2001) identified some special characteristic of beekeeping such as land owner ship is not essential; Hives can be placed everywhere; Require small investment for start up; Applicable profession for every one; Bees can be kept by people of all ages; Beekeeping do not need care and can be done with other works; The bye products are not less valuable than the main products; Bees pollinate flowering plants and enhance the production of seeds, crops, fruits vegetable and fibers; Beekeeping creates employments and increase the agro-based industry. Gibbon (2001) noted that bee keeping play an important role in the plants pollination and conservation of the natural environment. Beekeeping sustains agriculture which is the livelihood of the rural community by increasing yield through pollinating annual and perennial crops. Beekeeping is environmentally sustainable activity that can be integrated with agricultural practices like crop production , animal husbandry, horticultural crops and conservation of natural resources. Thus,

it would be one of the most important intervention areas for sustainable development of poor countries. Lance (2003) claimed that the production of honey by colonies depend on the race of the bees species, quantity of the bee colonies, type and quantity of the bee flora plants and on the part of the country and other environmental factors. A typical colony of bees can produce 80 to 120 pounds of surplus (harvestable) honey and 10 to 18 pounds of pollen in an average year. Nicola (2004) found beekeeping is an attractive business and high proportion of the people annual income is secured from beekeeping activities and helps to alleviate poverty and raise the livelihood of many people including village and urban traders, carpenters who make hives; tailors who make veils, clothing and gloves and those who make and sell tools and containers. Nicola (2004) explained that the beekeeping product honey, is the nutritious sweetener and has high cultural values. It has been used for different purposes such as in birth, marriage and funeral ceremonies. This cultural connection is more evident in the term “honey moon” in the Masai Society of Eastern Africa. Ojo (2004) studied that honeybee keeping is a sustainable enterprise that empower youth economically because of its many advantages over other types of agricultural enterprises. In beekeeping, the quality and quantity of land required is less important because hives are placed either on trees, ground and roofs of the buildings. Onwbuya (2004) examined that beekeeping contributes to the people livelihoods and can help to alleviate poverty in rural areas as beekeeping can be taken as a hobby, a social booster and can be practices by those who are not conventional farmers. UEBP (2005) noted that beekeeping is an interesting enterprise that require very little capital for start up , little land, less labor and can be easily practiced by men, women, youth and people with disabilities and can be practiced in parallel with other occupations. Due to these special characteristics beekeeping provides jobs opportunities for many different members of the community to use available natural resources to support their livelihoods. Beyene and David (2007) studied that due to the lack of information about the market value of beeswax, large amount of the beeswax produced in the remote areas of the country usually wasted and the individual beekeeper and the nation are losing incalculable benefits. There is no institution and research center in the country responsible for the beeswax marketing. The national institution such as Agriculture Research Council, Ministry of Trade, Chamber of Commerce and international agencies, all have not given due attention to the marketing research of bee products to generate information for stakeholders and policy actions. Bio (2007) told that beekeeping is an activity that can be easily practiced by every one. Beekeeping provides an opportunity for many different members of the community to use the available resources to support their livelihoods. It required minimal or no land, require small investment and takes minimal time and effort in a season. Beekeeping is a great income generator for landless people, elderly community members and excess agriculture labor. Alison and Brain (2008) observed that beekeeping play an essential role in sustaining modern civilization. Industrialization increased industrial farming, pesticides and the loss of habitat led to declined in wild insect population. As a result the role of these wild insects in the pollination of crops, fruits and vegetable has decreased. It is reported that these insects account for just 15% of global pollination. In response farmers have started to hire honeybee hives to pollinate their fields, thus creating a market for pollination. Today honeybees are over exploited, infected by parasites, exposed for pesticides and ill adopted to condition they work. Conarad (2007) stated that beekeeping is a non polluting agriculture activity which does not occupy cultivated land, require less investment and quick benefits can be obtained from this cottage industry. This type of farming is beneficial to increase crop and other flowering plants productivity through the process of pollination and help to sustain food insecurity. Messely (2007) noted that beekeeping is an important component of agriculture in many countries of the world and considered as a cottage industry for the rural development. Beekeeping is a useful means of strengthening livelihoods and has been identifies as a viable agriculture practice that could alleviate poverty and sustain rural employment. Beekeeping provide nutritional, economic and ecological security to the rural communities at the household level and is an additional income to household in the rural area. Apit (2008) explained that beekeeping offers great potential for development in almost all countries of the world. It does not need huge capital and large land , size and does not depend on importable inputs. It is easy and cheap to start, can be easily practiced by men and women, youth and disables and it is an important cash crop with ready local market, Beekeeping requires little land and therefore is an ideal activity for small scale resource, poor farmers. Beekeeping gives economic incentive to local people for the retention of natural habitat such as forest and therefore is an ideal activity in forest conservation. Melaku et al (2008) noted that how productivity and poor quality of bee products are the major economic impediment for rural communities. The communities also face another economic concern like lake of skill to manage their bees and bee products. Most of the rural beekeepers cannot afford to invest in beekeeping, packing their products, transportation of bees and their product to market in order to maximize their profit. Due to these reasons the beekeepers sell their products locally at lower prices than the domestic commercial markets to fulfill their needs. Nicola (2009) defined that beekeeping is the management of honeybee colonies to produce honey, honey products and to pollinate crops. It is one of the more universal agriculture activities practiced in the world for a long time. It helps to provide employment, alleviate poverty and contributes in the livelihood development of the people in almost every country of the world. Honey and other products obtained from beekeeping have been known by every society. Nicola (2009) found that

beekeeping generate means of alternative income. However, the financial outcome of this cottage industry will depend on many factors such as skill and experience of the beekeeper, the quality and quantity of the bee hive and the market available to the beekeepers as well as the bee flora available; climate and other factors. Nicola (2009) noted that some resources are required to undertake beekeeping activities. These resource are natural resources: bees plant and other natural resources; Human resources: The existing skills, knowledge of the producer and skill in packing and marketing; Social resources: Assistant available from families, friends, network member ship of groups, access to wider society, market information and research findings; Physical resources: Tools, equipments, building, transport and road; Financial resources: Finance required purchasing equipment and other inputs. Niki (2009) studied that beekeeping has significant role in the ensuring food security because honeybee pollinate cultivated crop, and vegetable and enhance their productivity. Honey bees are responsible for one third of all foods, such as fruits, vegetables and dairy products, including ice cream. Through the process of pollination, honeybees contribute to the world's food supplies. Not only do bees provide the means for many foods, they also contribute to the fight against global climate change. When bees pollinate, plants grow, the planet is cooler for the vegetation and greenhouse gases are reduced. Beekeeping can help to increase the honey bee population and promote a healthy environment and chemical free food. In a time in which bee colonies are decreasing, keeping bee is more important than ever, if not for bees, a host of crops would fail food shortages would follow. Without the presence of bees the existence of plants, animals and human is not possible. Ghandi (2010) stated that beekeeping is considered a traditionally, longstanding environmentally friendly activity which contributes to economy social development of a country by providing sustainable additional income self employment opportunities to the rural communities. BSCIC (2010) observed that beekeeping products have nutritional, medicinal and industrial value in the world. Such as honey is used as a food, medicinal value, pollen is used for health, as well as bee food and medicine, propels and bee venom also have medicinal values. Veronic (2011) found that honey bee keeping could be adopted along with many other livelihood activities and natural resources used by them are forestry, agriculture and conservation activities. Pollination is the most economically significant value of beekeeping in production of the crop in the world. Ayansola (2012) studied that beekeeping is a self reliance enterprise which provide employments to rural population and reduce the poverty and other social problems in the world while now a day, it is considered a profitable enterprise in all parts of the world. Ruhsana et. al (2017) studied that Bee honey is a main ingredient in traditional food culture in different regions of the world. The findings revealed that Western honeybees are dominant in the two countries for economic and physical reasons. Honey production has declined and the amount of imported honey has increased in Japan and South Korea. The domestic and global honey markets closely influence reciprocally. Furthermore, urban beekeeping has emerged in these two countries as a hobby and an industry; it contributes to producing domestic honey and enhances the quality of the environment. To ensure sustainable forestry and conserve biodiversity, native beekeeping is necessary. This study provides insight into beekeeping and honey production in Japan and South Korea. U.S Honey Industry Report (2016) indicated that the US Honey industry is evolving into the US Pollination and Bee industry. Small operations, even though there are thousands of them, coupled with many more thousands of backyard beekeeping hobby beekeepers are producing very little honey in the scheme of things. And those beekeepers with thousands of colonies, though still making a mark in the amount of honey consumed here, are obviously focusing on producing bees – for their own use in pollination, and for other beekeepers, whether large or small for replacements, or for the smaller operations in the form of packages or nucs for starters, replacers or growth. It is a slow evolution because keeping bees without making honey is, in many instances, difficult to do – bees make honey, that's what they do. So, some is produced that can't be recycled back into food for bees. But the labor cost of harvesting, extracting and dealing with this product, at less than \$2.00 and often less than a buck a pound is becoming a financial drain. Bees, or pollination. That, it seems, is becoming the name of the game. Khan et. al (2017) study revealed that bee keeping is one of the important economic activities in the area with an average annual income of Rs. 527,275/- per household. Results of paired t-test confirmed that beekeeping has significant effect on household income. On average of 2 family members per household were engaged in the beekeeping activity. It also provided multiple sources of employment mainly in honey transportation and marketing, thus beekeeping not only served as an income generating activity but also an employment generating activity in present and in future. The major constraints in beekeeping were the expensive inputs, pest attack, lack of modern production and rearing techniques, and trainings which can be overcome by a comprehensive program focusing on the provision of low cost inputs, pesticides/insecticides, modern techniques and trainings, and value chain market facilities at the local and regional level.

#### **4. Conclusion and Recommendations**

The study concluded that honey beekeeping is a very useful occupation in the rural area of the world. It generates employment and provides income to community of rural area which alleviates poverty in the long run. Beekeeping provides nutritional and ecological security to the rural communities at the household level in the



rural area. Honey beekeeping play key role in pollination and enhancing the agriculture production. They supply honey and their by products to the community which is very important for the control of health diseases. The investment in this business is very less and everyone can start easily in the world. Apis Millifera production was found more than the other species. Among world top ten countries China is number one while New Zealand is number 10 in honey bee production. The major constraints in beekeeping were the expensive inputs, pest attack, lack of modern production and rearing techniques, and trainings which can be overcome by a comprehensive program focusing on the provision of low cost inputs, pesticides/insecticides, modern techniques and trainings, and value chain market facilities at the local and regional level; New institution establishment of honey beekeeping in the world at local level for solution of honey bee problems; Construction of training center for skill transformation is required; Transportation and Marketing facilities network should be developed in the world for enhancing bee production; Credit facilities on low interest rate should be provided to honey beekeepers for development of honey bee production. Bee flora flower should be multiplied for enhancement of honey business in the study area.

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