

Beekeeping Needs of Farming Communities in the Hindu Kush-Himalayan Region

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Farming communities in the north-western Himalayas have a rich tradition of beekeeping with the Asian honeybee, *Apis cerana*, in wall hives. During surveys, a large number of wall hives (2–11) per farmhouse were observed. However, only 43.8 % were colonised. Interactions with farmers revealed that there were now fewer *A. cerana* swarms coming from the forests so occupancy had gone down. Modern beekeeping with *A. cerana* in Indian Standard Institution wooden hives had limited success because of the inherent traits of the bees to swarm and abscond. Farmers could not afford to invest large sums in the purchase of hives only to find that the bees had deserted. It is necessary to provide technology that fits a low-investment profile but has the benefit of scientific methods. Since the wall hive is already available and farmers are familiar with it, a technology was developed using this as a base. The scientific concept of movable frames was hybridised with the traditional structure to form the modernised wall hive.

Material and Methods

The traditional wall hive is a cavity left in a wall when a house is constructed. It is the thickness

Beekeeping in Pakistan: present status and economics

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Some 30,000–35,000 *Apis cerana* colonies occur in 4 types of traditional and 12 types of low-cost hives. A small number are in Langstroth hives in some government institutions for research and teaching. Commercial beekeeping has almost dispensed with this bee because of its non-profitability. *Apis dorsata* and *A. florea* have suffered pesticide losses mostly in cotton- and sugarcane-growing areas, being reduced to 40,000–50,000 colonies and about 12,000–15,000 colonies respectively. However, *A. florea* is safer in parts of the desert (Thar and Cholistan) and in coastal areas especially in mangrove (*Aicennia alba*) forests. American Foul Brood, first recorded in 1997, destroyed about 300 *A. mellifera* colonies in private apiaries. Some 6000 people were trained in modern bee management. Adoption of *A. mellifera* (more than 90,000 colonies) has increased honey production: average 4 kg/colony/annum from *A. cerana* in 1982 to about 21 kg/colony/annum in 1996 from *A. mellifera*, overall production from 250 t in 1982 to more than 1800 t in 1997. Sidder honey export (more than 210 t in 1996 sold locally at US\$ 9–10 per kg) has increased net income of about 11,000 beekeepers by 5–10 times. Small bee-farming units are being set up in collaboration with national/international institutions.

of the wall and varies in dimensions in different regions of the Hindu Kush-Himalayas (Verma et al., 1997). It has an entrance on the outside for the bees and is closed on the inside usually with a plank of wood plastered with mud.

The method followed for modernisation of a wall hive is given below.

- The hive was opened by removing the mud-plastered board covering its back (Fig. 1).
- The dimensions (height, breadth and depth) of the wall recess were recorded (Fig. 2).
- Wooden frames of the requisite size and with a proper intercomb distance were made on the spot (Fig. 3).
- Bees were smoked to expose the combs.
- Combs were cut from their attachment one by one with a knife (Fig. 4).
- While cutting, each comb was gently supported and placed flat on a wire gauze mounted on a frame provided with a handle, this helped in preventing the comb from falling and also protected the developing brood and adhering bees.
- During this operation bees were highly disturbed. Sometimes they came out of the hive in large numbers and started clustering on the wall outside. In order to settle the bees, and to save the queen and receive incoming foragers, an empty box with a small opening was temporarily placed just inside the hive entrance.
- Honeycombs were separated (Fig. 5).
- Combs with brood, pollen and honey were cut in such a way as to separate the upper sealed honey from the lower brood areas.
- Brood comb was immediately mounted on a frame and supported with wire (Fig. 6).
- The wall recess was thoroughly cleaned to remove pseudoscorpions, mites, wax moth, beetles, ants, and other robbers and scavengers.
- Then two supports for the frames were inserted and fixed at the top of each side wall of the recess (Fig. 7).

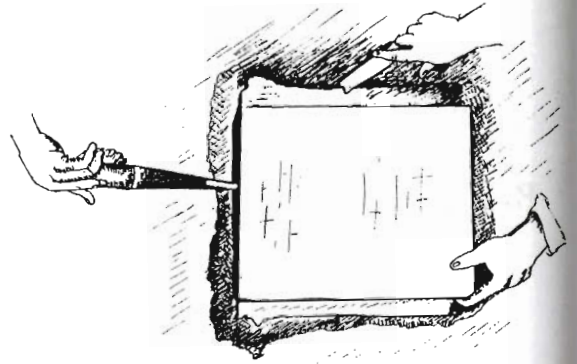


Fig. 1. Opening a traditional wall hive

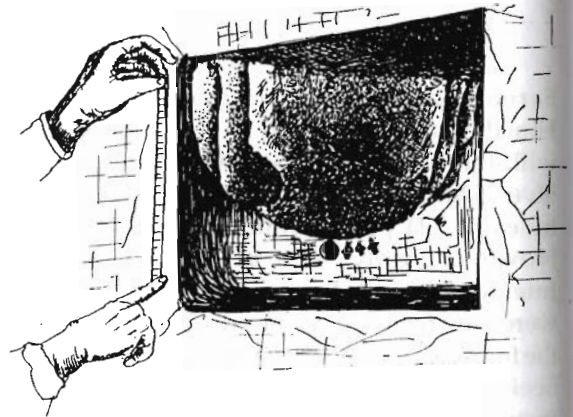


Fig. 2. Taking dimensions of the wall hive

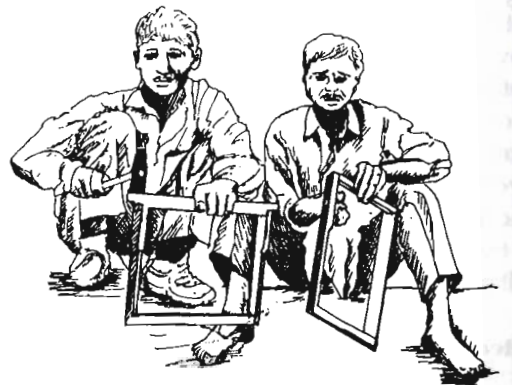


Fig. 3. Making precise movable comb frames on the spot

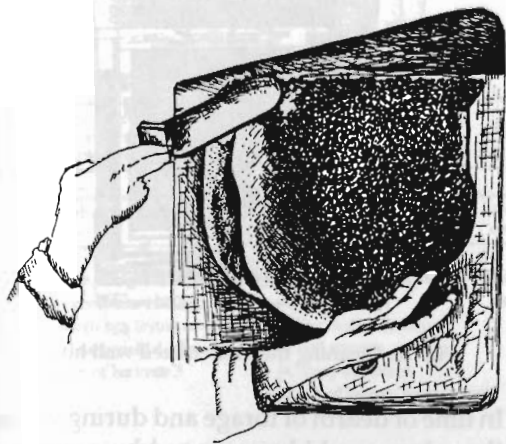


Fig. 4. Cutting the combs from the top

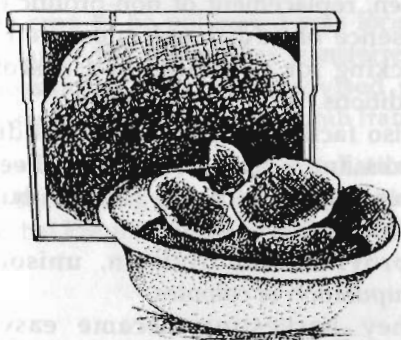


Fig. 5. Segregation of honey and brood portions of the comb

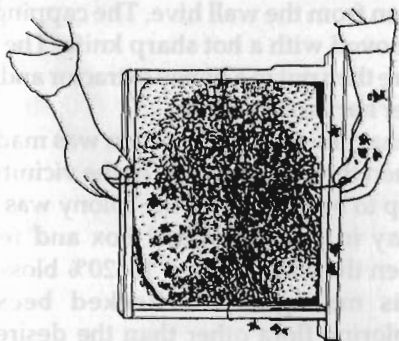


Fig. 6. Mounting brood combs on movable frames

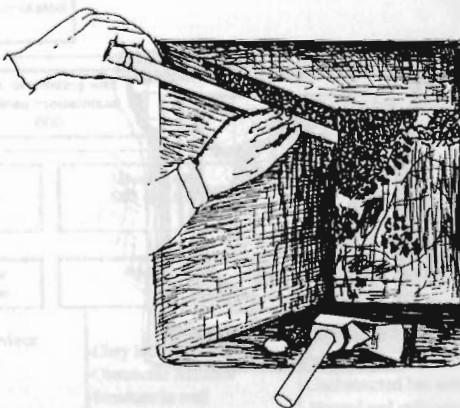


Fig. 7. Inserting ledges for holding comb frames

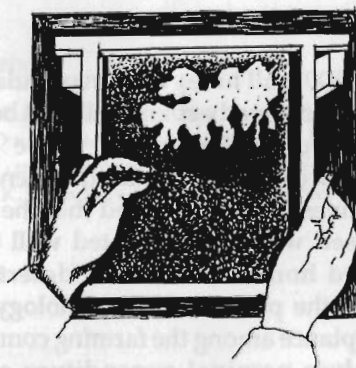


Fig. 8. Settling the bees in the modernized wall hive

- Comb frames were introduced on to the supports one by one and the bees settled back on to the combs (Fig. 8).
- Care was taken to complete the process in as short a time as possible to prevent chilling and loss of brood.
- Additional manipulations – segregating wax moth-infested combs, giving fresh comb-foundation sheets, wiping off honey spilled in the recess and reducing the size of the entrance – were also done as required.
- Thick sugar syrup (1 kg of sugar dissolved in 1 litre of water) was fed to the bees to help them recover from the shock (Fig. 9).

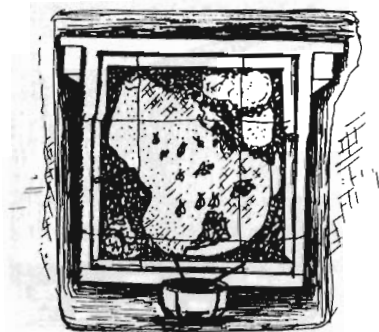


Fig. 9. Sugar feeding in modernized wall hive

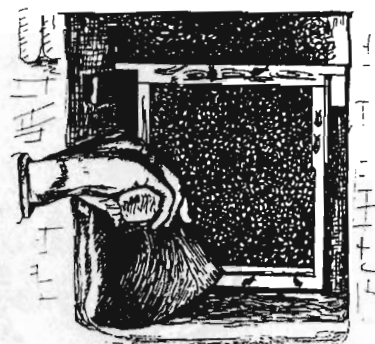


Fig. 10. Cleaning the modernized wall hive

- The wooden cover was replaced and the wall hive was closed by plastering with mud.

Results and Discussion

A total of 1500 wall hives were manipulated. Of these 700 were already colonised with bees, 600 were unoccupied and 100 were newly constructed according to standard dimensions of *A. cerana* hives. It was observed that the bees in the colonised wall hives adapted well to their modernised home and did not desert under pressure of the process. The technology found quick acceptance among the farming community as it involves nominal expenditure and the farmer could make the requisite modifications himself. The modernised wall hive provided the following benefits.

- The modernisation process caused little burden to the beekeepers' pocket. The entire improved structure involved an expenditure of US \$1-2 (Rs 50-60) for wooden frames, nails, wire and labour per wall hive.
- It offered a situation for scientifically managing a honeybee colony.
- The movable frames could be taken out and the colony observed for health, bee strength and food storage.
- The hive interior could be cleaned to keep off wax moth, scavengers and robbers (Fig. 10).
- In time of dearth of forage and during winter the colony could be managed by providing sugar feeding.
- Modernisation facilitated checking of the queen, replacement of non-prolific queen, presence of additional queen cells, and checking for swarming and absconding conditions.
- It also facilitated provision of additional combs and comb-foundation sheets for increasing space during strength build-up and honey flow.
- It provided for division, unison and manipulation of colonies.
- Honey harvesting became easy and economic. Segregation of honeycombs and efficient extraction of hygienic honey without damaging brood and bees was easily achieved. The frames with sealed honey were taken from the wall hive. The cappings were removed with a hot sharp knife. The frames were then put in a honey extractor and reused after harvesting honey.
- Management for pollination was made easy. When the wall hive was in the vicinity of the crop to be pollinated, the colony was moved away in an improvised box and returned when the crop reached 15-20% blossoming. This management checked bees from exploring flora other than the desired crop and pollination was more complete. When

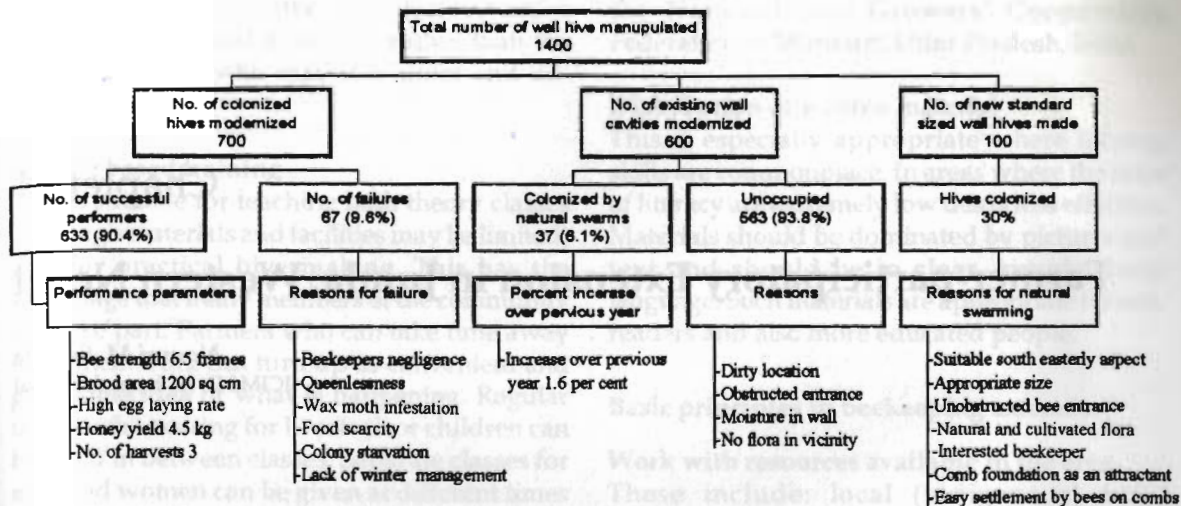


Fig. 11. Success story of modernized wall hives

the crop to be pollinated was located at a distance, the colony was transferred to the blossoming crop in improvised package boxes that could hold the comb frames.

The success story of the installation of this novel beekeeping technology in the mid-hills of Himachal Pradesh, India, is depicted in Fig. 11.

References

- Verma, L.R., Khosla, P.K. and Kumar, R. 1997. *Appropriate R&D needs and extension strategies in beekeeping for better fruit crop production in fruit crops pollination* (L.R. Verma and K. K. Jindal; eds). Kalyani Publ. New Delhi, pp. 376-392.