

Role of ICIMOD in the Promotion and Development of *Apis cerana* Beekeeping

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The primary objectives of the International Centre for Integrated Mountain Development (ICIMOD) are to help promote the development of an economically and environmentally sound mountain ecosystem and to improve the living standards of mountain populations in the Hindu Kush-Himalayan region. The Mountain Farming System Division implements the project entitled 'Promotion and development of beekeeping through the preservation of indigenous *Apis cerana*', the Asian hive bee.

Beekeeping Activities with *Apis cerana*

Apiculture is an important resource for mountain farming systems and offers specific advantages for developing sustainable agriculture. Beekeeping with the Asian hive bee, *Apis cerana*, is a traditional occupation in Nepal and parts of the region as an income-generating activity for small and marginal farmers, landless labourers, and other poorer people living at or below subsistence level. In addition, bees play an important role in the pollination of agricultural and horticultural crops and many indigenous plant species, thereby maintaining biological diversity. Nepal is rich in bee flora and there are

at least four species of honeybee that might have potential for development.

With the support of the Ford Foundation, a survey made in 1988-89 to establish the status of *A. cerana* showed that the population was declining. In order to save this species from possible extinction, ICIMOD is promoting beekeeping with it. A USAID-funded programme from mid-1991 to mid-1993 on genetic diversity of *A. cerana* found the following. There was a decline in beekeeping in the Hindu Kush-Himalayan region. Computer-assisted multivariate morphometric and mitochondrial-DNA analysis revealed that *A. cerana* can be divided into three biotypes or geographical populations: *A. cerana cerana*, *A. cerana himalayana* and *A. cerana indica*. Research on pollination ecology of vegetable-seed production suggested that use of *A. cerana* as a pollinator increased yield by 40-50 % in cross-pollinated crops such as cauliflower, cabbage, radish and by 20% in self-pollinated crops such as Indian mustard and lettuce. Also behaviour and apiary management research increased productivity and efficiency of *A. cerana* bees for honey production and pollination activities.

Promotion and Development of Beekeeping through the Preservation of *Apis cerana*

The project entitled 'Promotion and development of beekeeping through the preservation of indigenous *Apis cerana*' was implemented by ICIMOD in mid-1993. The project is funded by the chancellery of Austria. ICIMOD is carrying out this project with the co-operation of Austroprojekt, Vienna, Austria. The first phase of the project from mid-1993 to 1995 focused mainly on beekeeping research. The second phase, from 1996 to 1998, focuses largely on training and extension for beekeepers and also includes beehive testing, awareness, and pollination components in four locations in Nepal namely Bhaktapur, Godawari, Jumla and Dadeldhura. The partner institutions are local NGOs. The clients are mainly farmers groups. International/intellectual support is provided by Austroprojekt Austria, Asian Apicultural Association and Apimondia.

Beekeeping Research

This component consists of research into honey-plant resources of the Hindu Kush-Himalayan region, crop pollination studies, and testing beehive types. A survey and collection of honey plants from different agro-ecological zones of the Hindu Kush-Himalayan region, preparation of pollen slides, establishment of a reference databank on pollen, and preparation of an inventory of important honey plants in the region has been carried out. The effects of *A. cerana* and *A. mellifera* on the pollination of different crops has been studied and a manual prepared. Suitable hive types for *A. cerana* for different ecological zones are being tested in Jumla (western high-hill conditions) and Godawari apiary (Kathmandu valley conditions).

A two-year study on Thai Sac Brood Virus Disease (TSBVD) of *A. cerana* in Nepal has been made in three locations: Jumla (western high

hills), Kathmandu valley and surroundings (central region) and Bhojpur (eastern mid-hills). The study reveals the severity of the disease in Nepal and further confirms the decline in the population of *A. cerana*.

Beekeeping Training and Extension

Training and extension are limited to Nepal. Major focus is on training of trainers and farmers from three districts representing mid-hill, high hill and valley conditions. Support is given to farmers/beekeepers groups and also NGOs; local institutions and individual beekeepers. Training is usually provided to a group and is as practical as possible. The poor and women farmers are encouraged to attend.

The training programme covers aspects such as improved beekeeping methods, seasonal management of colonies, bee pests and diseases, movable-frame hive management, low-cost frame hives and other tools and equipment, bee pollination management, queen-rearing techniques, colony care, etc. In addition, training is also provided on the use of hive products, e.g., honey harvesting and bottling, processing of beeswax, and making of candles, hand creams, etc. Such market support encourages farmers to work with and promote *A. cerana* beekeeping in their area.

Training and extension activities are carried out with the co-operation of local NGOs. With their staff now trained, it is hoped that beekeeping will continue after the project period. As beekeeping with *A. cerana* is traditional in Nepal, the training and extension have been useful for improving techniques commonly used at household level. There has been a great demand for the support provided by the ICIMOD Beekeeping Project and there is potential for further development in Nepal and the Hindu Kush-Himalayan region with the support of international institutions such as ICIMOD and Austroprojekt, Austria.

Summary of ICIMOD Activities Concerning the Promotion and Development of *Apis cerana* Beekeeping (1990 to date)

Books

- Beekeeping in Integrated Mountain Development: Economic and Scientific Perspectives.
- Honeybees in Mountain Agriculture.
- Himalayan Honeybee *Apis cerana* as a Pollinator of Vegetable-Seed Production: An Awareness Handbook
- Bee Flora of Hindu Kush-Himalayas: Inventory and Management.
- Dictionary of Beekeeping Terms: English-Hindi-Chinese.

Discussion papers

- Managed Crop Pollination: The Missing Dimension of Mountain Agricultural Productivity.
- Crop Pollination by Farmers: Case Studies from India and China. (In progress.)

Manuals

- Pollination Management of Mountain Crops through Beekeeping: Trainers' Resource Book.
- Beekeeping Training Manual. (In progress.)

Reports (internal)

- Honey in Nepal: A Market Study.
- Study on Thai Sac Brood Virus Disease in Nepal.
- Annual Reports on *Apis cerana* Beekeeping in Bhaktapur, KNSN 1996, 1997.
- Annual Reports on *Apis cerana* Beekeeping in Dadeldhura, RUWDUC 1996, 1997.

- Annual Reports on *Apis cerana* Beekeeping in Jumla, Jumla Program 1996, 1997.
- Six-monthly and Annual Project Progress Reports (July 1993 to December 1998).

International conferences/workshops

- International Expert Meeting on (*Apis cerana*) Beekeeping Development in the Hindu Kush-Himalayan Region, Kathmandu, Nepal (21-23 June 1989).
- Fourth AAA International Conference, Kathmandu, Nepal (25-27 March 1998).
- International Beekeeping Workshop on Beekeeping Extension with *Apis cerana* (23-24 March, 1998).
- International Beekeeping Workshop on Thai Sac Brood Virus Disease of *Apis cerana* and Varroa Mites of Bees (23-24 March, 1998).

Proceedings

- Proceeding of International Expert Meeting.
- Proceedings of Fourth AAA International Conference and International Workshops (In Progress).

Papers, posters, exhibitions, videos

Around 50 papers have been published by ICIMOD alone or together with others. These are for planners, development workers, scientists, field workers and farmers. Subjects cover a wide range of issues such as genetic diversity, pollination, honey plant resources, bee behaviour, beehives, beekeeping extension and beekeeping development. ICIMOD has also participated in two poster sessions and two exhibitions at the international level and has prepared two videos.