

Living with Honeybees – A Decade of Enrichment of Thought and Understanding

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Indigenous honeybees occupy a major place in the apicultural landscape of the Hindu Kush-Himalayan (HKH) region. The region is home to five different species of indigenous honeybees, *Apis cerana*, *Apis dorsata*, *Apis florea*, *Apis laboriosa*, and *Apis andreniformis*. Bees play an important role in the pollination of various crops and natural flora and enhance floral diversity and agricultural productivity.

The HKH region produces over 36,000 tonnes of honey per year from over four million colonies and nests of indigenous and exotic honeybees (Ahmad et al. 2007). Most of the bee farmers in the HKH region fall into the category of the poorest of the poor and generally live in less accessible areas, managing domesticated bee species in backyard gardens, as well as conserving and safeguarding wild bees to harvest small quantities of honey.

Due to habitat changes, the ongoing expansion of monoculture, the extensive use of pesticides and other agro chemicals, and competition from the exotic *Apis mellifera*, the number of indigenous honeybees has declined significantly over time. Other factors, such as

insufficient focus by national institutions and their lack of capacity, and the changing economic and social landscape, have further aggravated this decline in population across large parts of the HKH region. This situation prompted ICIMOD to conduct research to better understand indigenous honeybees and their role in the livelihoods of the poor, pollination, and productivity, and the extent of the damage caused by exotic bee species to local populations. Research was needed to increase the productivity of the Asian hive bee *Apis cerana* through management, selection, and queen rearing. Given the wide distribution of *Apis cerana* across the Himalayas, there was an urgent need to facilitate and strengthen the networks of beekeeping organisations and help communities to learn about



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Group of women from Mugu, Nepal with bee veils

beekeeping and to pass on the knowledge generated through research. In addition, to promote modern beekeeping efforts, the potential for marketing and business development of bee products had to be explored. To do this, a holistic and integrated Indigenous Honeybee Programme was developed based on action research with the aim of conserving indigenous bee populations and supporting income generation in mountain communities through the development of bee enterprises. This undertaking, implemented in phases, has been made possible through the generous support of the Government of Austria.

A strategy was developed to bring together individuals and organisations (local, regional, and international, and including government departments and research, and academic, and training institutions) to focus on the dual goals of poverty reduction and biodiversity conservation (ICIMOD 2007). On a strategic level, dialogue about the promotion and development of indigenous honeybees was started to enhance knowledge, promote relevance, and disseminate information. On a tactical level, a core of knowledge partners including universities, the Food and Agriculture Organization (FAO), the US State Department, and regional research institutions were networked to promote the craft of apiculture and pollination management. Training curricula were developed in collaboration with knowledge partners for different levels of stakeholders. At the village level, a community-

based approach was adopted to support farming communities at project sites in India, Nepal, and Pakistan so that they could refresh their understanding and increase the productivity of local bee strains. Honey hunting communities in Nepal were encouraged to conserve the (indigenous) bees while harvesting honey and a balanced approach to honey hunting was promulgated. Innovative ideas, like bee watch tourism, were promoted to augment the income of the people living in honey hunting areas. Special care was taken to help communities understand that the development model used is endogenous, requiring minimal exogenous inputs, to enable them to take ownership and feel empowered. Arrangements were made to mobilise the resources of partners to enhance the effectiveness and efficiency of the programme.

This article highlights some of the successful outcomes of the indigenous honeybee programme, which started as a small research initiative and evolved through different phases to include basic research, farmer participatory action research, capacity building, and scaling up through partnership development with rural development organisations. The programme opened up vistas of knowledge and opportunity in the following areas: conservation and promotion of indigenous honeybees, livelihood improvement and poverty reduction, capacity building and skills development, pollination and ecoservices, and markets and business development.



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Colony inspection – *Apis cerana* comb on top bar hive

Achievements

Conservation and promotion of indigenous honeybees

The endogenous approach to beekeeping development used by the ICIMOD programme, with limited exogenous inputs, helped to mobilise local resources, encouraged innovation, and facilitated a positive attitude to the conservation and promotion of indigenous bees. The approach included farmer-managed selection and multiplication of *Apis cerana*, which led to an increase in honey productivity from a mere two kilograms per hive per year to an average of six kilograms at project sites, and a maximum of 13 kilograms at one site (Ahmad et al. 2008). The adoption of better management practices by farmers resulted in a reduction in absconding, greater resistance to disease and parasites, and an increase in colony numbers and colony strength. Studies were also conducted on wild bees like *Apis laboriosa*, which nests on cliff faces and produces large quantities of honey for honey hunting communities, as well as providing crucial pollination services to high mountain crops and flora. The *Apis laboriosa* species was found to be in decline (Underwood 1986) and a mitigation process was

Beekeeping Entrepreneur

Twenty year-old beekeeper, Mr Abdul Shakur, was trained in beekeeping by the Bangladesh Institute of Apiculture (BIA) in Bandarban district. He started beekeeping with one colony and multiplied it to make four colonies of *Apis cerana* in his backyard garden. He earned US \$200 in one year selling honey at the rate of US \$15 per kilogram. He used this money to buy a wireless communication system and established a communication centre, which is now earning him US \$40 per month. He uses the income to buy school books and clothes for his brother and sister.

initiated to stabilise populations for the sake of biodiversity and to protect livelihoods. Honey hunters were involved in the programme to help reverse the decline. Through training, capacity building, and awareness raising, conservation efforts like selective harvesting and bee watch tourism were adopted by communities. Annual data for the last eight years, covering more than 30 cliff sites, shows that populations are now stabilising (Ahmad et al. 2006).

Livelihood improvement and contribution to poverty reduction

Bees contribute enormously to income generation through bee products and pollination services. It has been estimated that through pollination services to

agriculture and surrounding flora, beekeeping helps communities to generate income equivalent to 14 times the investment required (Free 1993). ICIMOD's beekeeping interventions contributed to the ultimate goal of livelihood improvement by promoting and facilitating organisational support for beekeeping and honey hunting communities so that they could organise themselves to promote and develop their beekeeping businesses. Our studies show that beekeeping with *Apis cerana* helps farmers in remote areas of Nepal to generate around US \$45 per year on average through the sale of honey from backyard bee colonies (Gurung et al. 2003). Further to this, one bee colony fetches over US \$30 per year in rent for pollination services in the apple growing areas of Himachal Pradesh, India (Partap and Partap 2002). This is possible due to the interventions implemented by ICIMOD.

Capacity building and awareness raising

Capacity building efforts by the programme were focused on partnership development, networking, curriculum development, and training. ICIMOD working together with 27 partner organisations and networks, trained more than 7000 individuals (30% of them women) using mostly practical learning tools and field testing. To ensure sustainability at a higher level, a special programme was launched with the help of universities to train young scientists and support research in bees and pollination. A website (www.bees4livelihood.icimod.org) was developed and made accessible to partners and other stakeholders to strengthen communication and share information. All these activities helped to increase the number of honeybee colonies in moveable frame hives in different project sites. In Jumla, top bar hives and wax processing was introduced, and there are now over 400 *Apis cerana* colonies in top bar hives. Wax processing emerged as a new business opportunity and

Jumla beekeepers, who used to throw away their wax, are now processing it into a variety of products including skin creams and balms (ICIMOD 2005). A core group of trainers in the art of wax processing was gathered together in Nepal. In Kaski, a number of new bee-related businesses have emerged, such as hive carpentry, nucs making, and queen production, resulting in an increase in the number of bee colonies by more than 50 times. In one site in Nepal (Alital), more than 80 per cent of trainees adopted beekeeping in moveable frame hives (Gurung et al. 2003).

To raise awareness and expand the horizon of generated knowledge, alliances were made with electronic and print media, including the BBC and National Geographic. This has been an important boost to the programme and has helped to convince stakeholders about the importance of indigenous bees.

Pollination and ecoservices

Pollination and ecoservices were always an important theme of the indigenous bee programme. A substantial amount of knowledge and information was generated and disseminated by the programme in collaboration with regional and international partners including initiating, conducting, and publishing of 12 case studies. Books, training manuals in different regional languages, videos, and policy papers were produced to highlight the issues and raise awareness about the value of honeybees to agriculture and biodiversity (Partap 2003; Partap and Partap 2001, 2002; ICIMOD 2005, 2007). Special efforts were made to develop knowledge and

programme partnerships with major international and regional initiatives. Significant contributions were made to a policy and practice manual on pollinators and pollination edited by Connal Eardley and his co-workers in 2006 (Eardley et al. 2006), which addresses the issues in a holistic way and provides solutions at a tactical level. Programme partners in the region were supported to become part of a GEF-FAO led global initiative on the conservation and sustainable use of pollinators through the ecosystem approach. This has given the programme a strategic boost in the eyes of partners and concerned stakeholders. Following this, an awareness raising strategy paper was developed to promote pollination and pollinator conservation for FAO, which helped to disseminate information.

The idea of a managed pollination process, which was not even in the mainstream of extension messages when the programme started, is now being taken care of by farming associations and local governments in ICIMOD project areas. This has led to the development of pollination enterprises in cash crop farming areas. In Himachal Pradesh alone, the demand for bees for pollination exceeded 200,000 colonies, which is difficult to provide with the existing beekeeping infrastructure (Partap and Partap 2002).

Markets and business development

So far, the focus of many business development experts in the region has been limited to the marketing of honey. Changing this mind set was a challenge, as carpentry products like hives, other bee equipment, queens,



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Helping farmers to make beeswax products during a training programme

Frame hives made locally in Kaski, Nepal

Three small carpentry workshops were established by trainees of the beekeeping project. These workshops not only cater to the demand of beekeepers, but also provide services to home builders. Before the project intervention, farmers had to transport frame hives from Chitwan or Kathmandu. The carpentry workshops have produced 2000 frame hives in Armala and Ghachowk villages and sold over 1500 hives locally, worth US \$20,000.

colonies, nucs, pollinator colonies, and wax products are also major marketable commodities. To address this issue, ICIMOD's partners adopted all the components of bee business development in their business plans (ICIMOD 2005, 2007). Indigenous bees produce smaller quantities of honey and the supply line is scattered, so it is important to develop a business development plan leading to value chain analysis for small beekeepers, producers, and handlers. Although this has not yet materialised, the efforts made so far are on track to achieve the business development goals. Products other than honey are attracting the attention of markets and are being supplied by handlers to consumers, leading to the establishment of micro enterprises by farmers in remote areas. Wax handlers in Nepal have been linked to cosmetic manufacturers in Thailand, which is making productive use of beeswax and bringing income to producers (ICIMOD 2007). To rationalise planning for business development, a special market survey was carried out to better understand existing honey flow and marketing mechanisms, markets, pricing mechanisms, and the niche value of indigenous honey. To further strengthen the argument, honey from different sources was analysed and its properties were documented. This exercise led to a dialogue and discussion on the weaknesses of the Codex Alimentarius and the directives of the European Commission on honey, which discriminate against honey produced by honeybees other than *Apis mellifera*.

Future prospects

Notwithstanding the achievements, there is much still to be done in terms of institutionalising the successes of the programme and disseminating the results for wider impact across the HKH region. Capacity building will continue to be an integral part of any future programme on honeybees. In addition, increasing honey production to meet the growing demand for organic honey in order to reduce poverty among the poor honey producing communities of the HKH and to counteract the reduction in the efficiency of pollination services requires new thinking and approaches to efficiently utilise and develop available honeybee resources. The impact of climate change is another important issue that requires attention. A better understanding of the changing

scenario will enable ICIMOD and its regional partners to take the opportunity to expand the programme and address the emerging needs of beekeeping development. The following areas of intervention and activities are being planned in line with ICIMOD's new Medium Term Action Plan (2008-2012):

- Curriculum development for universities and technical/vocational institutions and the exchange of information and experiences
- Inputs for honey trade policy and value chains for bee products and services
- Networking and scaling up of bee programmes in participating countries
- Pollination and its integration with horticulture, and support to the GEF-FAO global programme on pollinators
- Analysis of the role of honeybees in providing necessary pollination services to mountain ecosystems and agriculture in the context of poverty and livelihoods
- Technical assistance to bee programmes in HKH countries

References

- Ahmad, F.; Joshi, S.R.; Gurung, M.B. (2003) *The Himalayan Cliff Bee Apis laboriosa and the Honey Hunters of Kaski*. Kathmandu: ICIMOD
- Ahmad, F.; Partap, U.; Gurung, M.B. (2007) *Concept Note on the Future Dimensions of the Austrian Government Supported 'Honeybees in the Himalayas' Programme of ICIMOD*. Kathmandu: ICIMOD
- Ahmad, F.; Partap, U.; Gurung, M.B.; Joshi, S.R. (in preparation) *Addressing Poverty and Managing Sustainability through Beekeeping*. Kathmandu: ICIMOD
- Eardley, C.; Roth, D.; Clarke, J.; Buchmann, S.; Gemmill, B. (2006) *Pollinators and Pollination: A Resource Book for Policy and Practice*. Pretoria: African Pollinator Initiative
- Free, J.B. (1993) *Insect Pollination of Crops*. London: Academic Press
- Gurung, M.B.; Ahmad, F.; Joshi, S.R.; Bhatta, C.R. (2003) 'The Value of *Apis cerana* Beekeeping for Mountain Farmers in Nepal'. In *Bees for Development Journal*, 69:13
- ICIMOD (2005) *Indigenous Honeybees of the Himalayas: A Community-based Approach to Conserving Biodiversity and Increasing Agricultural Productivity*. Terminal Report submitted to the Austrian Coordination Office of the Austrian Development Agency, Thimphu. Kathmandu: ICIMOD
- ICIMOD (2007) *Honeybees of the Himalayas: Promoting Partnerships with Rural Development Organizations in the Region*. Terminal Report submitted to the Austrian Coordination Office of the Austrian Development Agency, Thimphu. Kathmandu: ICIMOD
- Partap, U. (2003) 'Improving Agricultural Productivity and Livelihoods through Pollination: Some Issues and Challenges'. In Waliyar, F.; Collette, L.; Kenmore, P.E. (eds) *Beyond the Gene Horizon*, pp 24-26. Patancheru (India): ICRISAT and Rome: FAO
- Partap, U.; Partap T. (2001) 'Declining Apple Production and Worried Himalayan Farmers: Promotion of Honeybees for Pollination'. In *Issues in Mountain Development No. 1/2001*. Kathmandu: ICIMOD
- Partap, U.; Partap T. (2002) *Warning Signals from the Apple Valleys of the Hindu Kush-Himalayas: Productivity Concerns and Pollination Problems*. Kathmandu: ICIMOD
- Underwood, B.A. (1986) *The Natural History of Apis laboriosa Smith in Nepal*, MS Thesis. Ithaca, New York: Cornell University