

# **Pollinators Research and Development in the HKH Region**

## **An Overview of ICIMOD's Pollination Programme**

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# **The International Centre for Integrated Mountain Development (ICIMOD)**

## **Vision**

*“Prosperous and secure mountain communities committed to peace, equity and environmental sustainability”*

## **Mission**

*“To develop and provide integrated and innovative solutions, in cooperation with partners, which foster action and change for overcoming mountain people’s economic, social and physical vulnerability”*

# Programme Implementation Approach

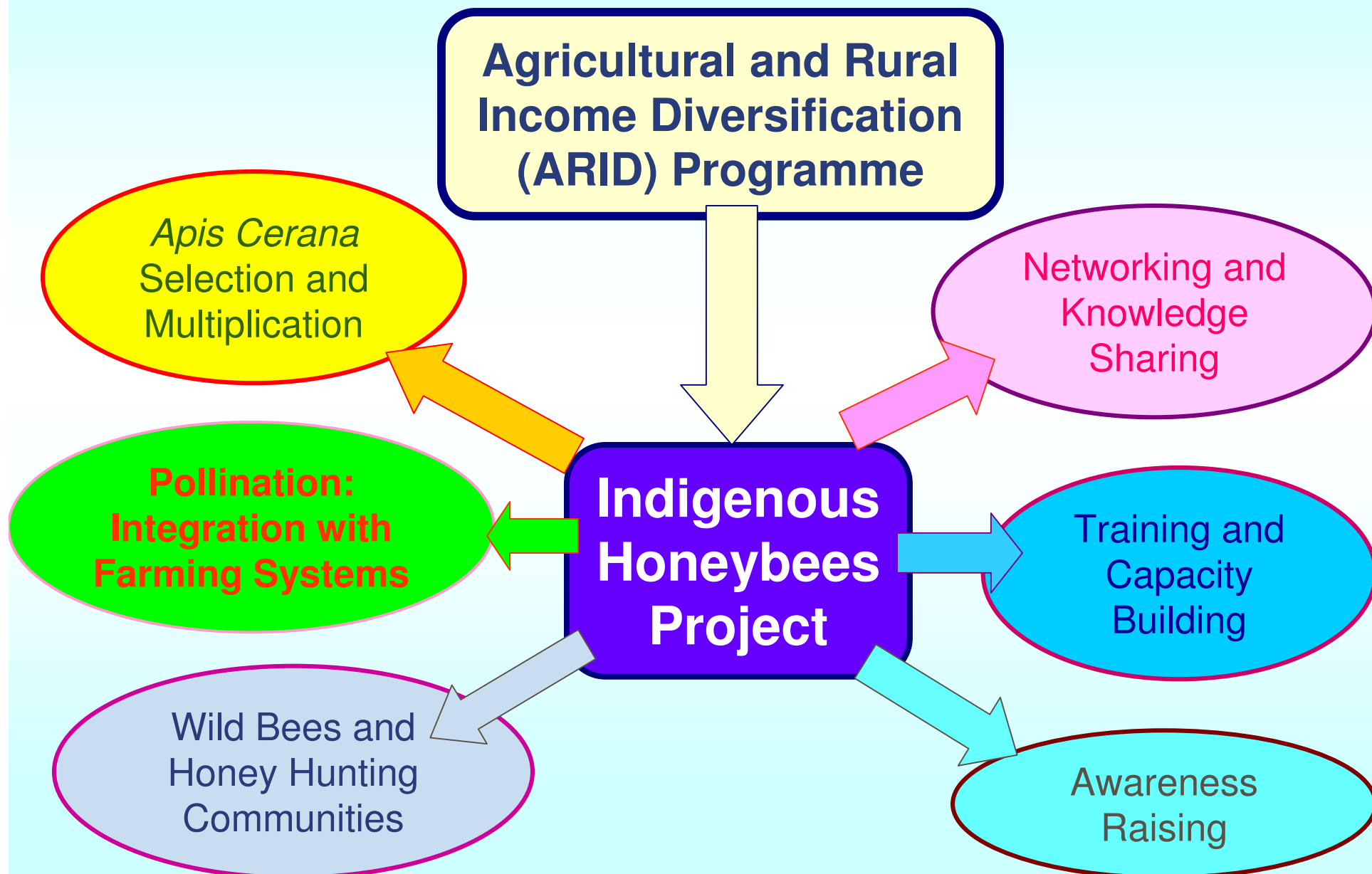
- ICIMOD works in eight countries of the HKH region – Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan through NCIs including both GOs and NGOs
- Has about 300 partner institutions in the region and outside for programme implementation
- Has about 150 staff recruited from the region as well as from outside

# ICIMOD's Programme Areas

- Natural Resources Management (NRM) Programme
- Agricultural and Rural Income Diversification (ARID) Programme
- Water, Hazards and Environmental Management (WHEM) Programme
- Culture, Equity, Gender and Governance (CEGG) Programme
- Policy and Partnership (PP) Programme
- Information and Knowledge (IKM) Programme



# Pollinators Programme in ICIMOD



# Development of Pollinators Programme in ICIMOD

Phase I (1988- April 1991): Review of the Status of Beekeeping and its Importance  
*Apis cerana* populations declining; *Apis mellifera* promoted for beekeeping; no focus on using bees for pollination except for experimental research in the universities



Phase II (May 1991-June 1993): Exploration of Genetic Diversity in the Himalayan Honeybee, *Apis cerana*  
Research to identify subspecies of *Apis cerana*, on-farm research on pollination initiated



Phase III (July 1993-December 1998): Promotion and Development of Beekeeping through Conservation of Indigenous *Apis cerana*  
Initiated research on selection and multiplication of more productive races of *Apis cerana*; training and extension in improved methods of *Apis cerana* beekeeping; research on honey plant resources; field studies to assess pollination status initiated



Phase IV (Jan 1999-December 2004): Indigenous Honeybees of the Himalayas: A Community-based Approach to Conserving Biodiversity and Increasing Farm Productivity

Programme expanded to include conservation and sustainable management of all indigenous honeybee species through community participation; action research on *Apis cerana* selection and multiplication, action research on pollination; studies on pollinators and factors affecting their populations and natural pollination

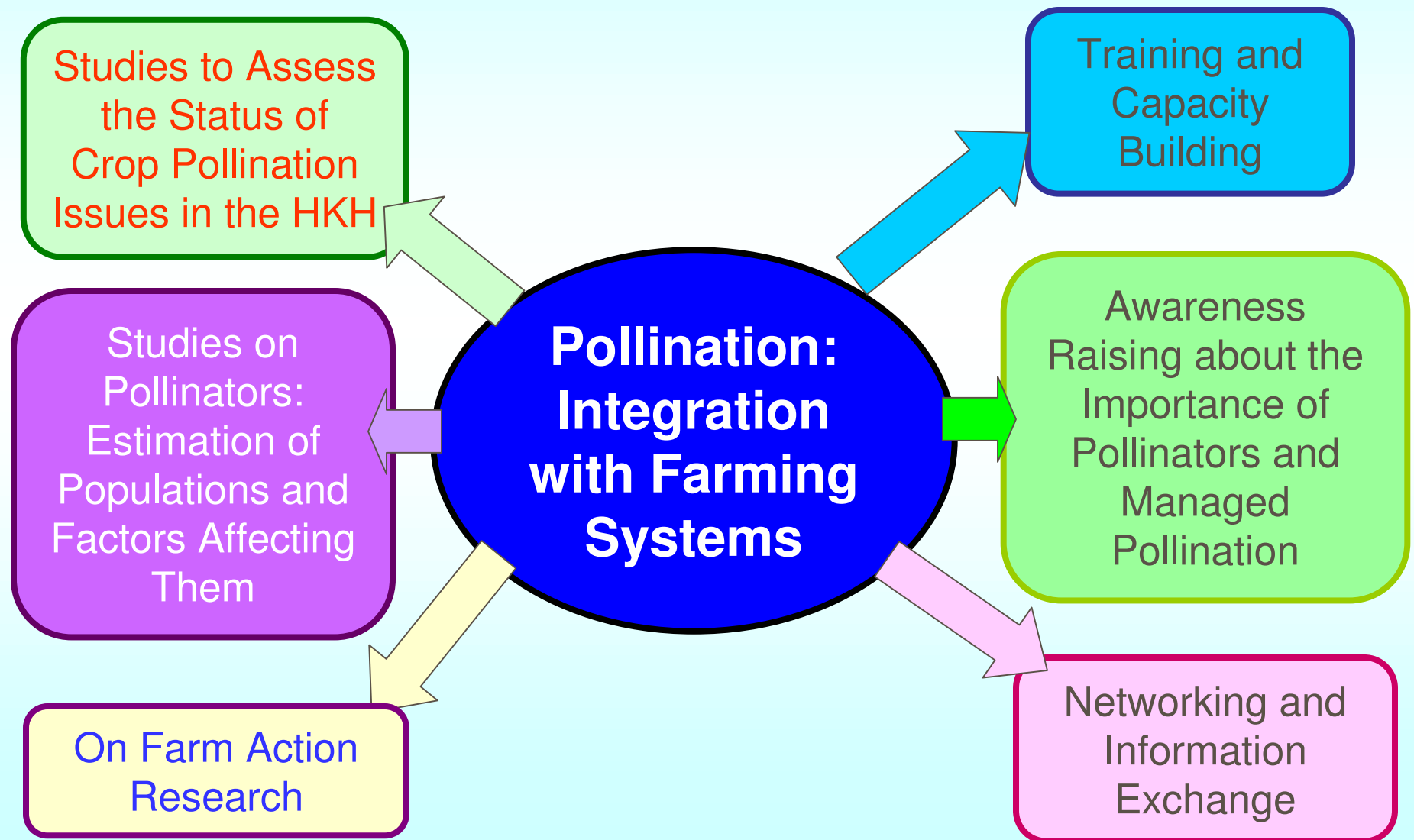


Phase V (2002): Initiated Partnership with FAO for Implementation of IPI of CBD: Promoting conservation and sustainable use of pollinators including indigenous honeybees

# **Overall Goal of the Pollinators Programme**

To improve the livelihoods of mountain people through increasing agricultural productivity and conserving biodiversity by promoting conservation and sustainable use of indigenous honeybees and other pollinators to ensure pollination of mountain crops and the indigenous plants

# Programme Focus



# I. Assessment of Crop Pollination Problems

- Studies to assess crop pollination problems in selected sites in India, China, Pakistan, Bhutan and Nepal
- **Findings:** crop productivity declining due to inadequate pollination
- **Reasons for inadequate pollination:** lack of pollinators, lack of pollinisers, bad weather during flowering
- Farmers aware of the problem in Himachal Pradesh, India and Maoxian county, China and making efforts to manage pollination
- No specific management practices reported in Pakistan, Bhutan and Nepal: **this could be because farmers are less aware of the pollination management practices or the problem is less serious in these countries**

# Polliniser Management in Himachal Pradesh

## Farmers increase polliniser proportion by...



planting  
polliniser  
trees



grafting pollinisers on  
the main varieties since  
grafts produce flowers  
earlier than the newly  
planted trees



## As a short-term solution to increase polliniser, farmers in Himachal Pradesh...



cut flowering branches from the polliniser trees, put them in plastic bags full of water and hang them on to the trees of the main varieties



# **Increasing the Number of Pollinators in Himachal**

## **Farmers increase number of pollinators by using...**



**colonies of honeybees. A well organized system for renting honeybee colonies for apple pollination is in place in Himachal Pradesh, India**



# Hand Pollination of Apples in Maoxian County, China

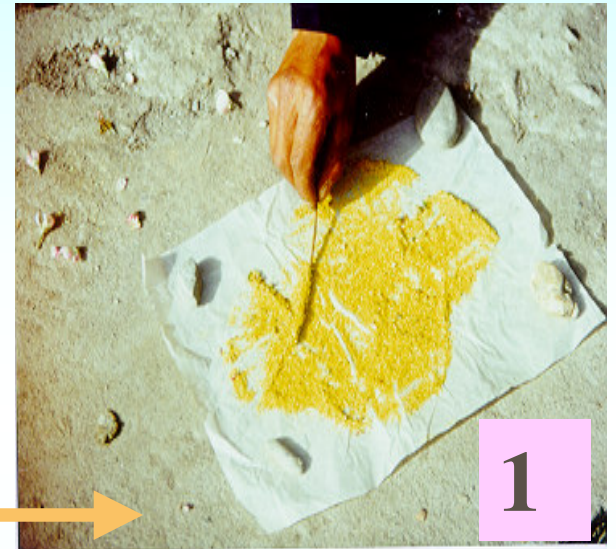
Farmers extract pollen from flowers of polliniser variety at balloon stage by .....



rubbing two flowers  
against each other

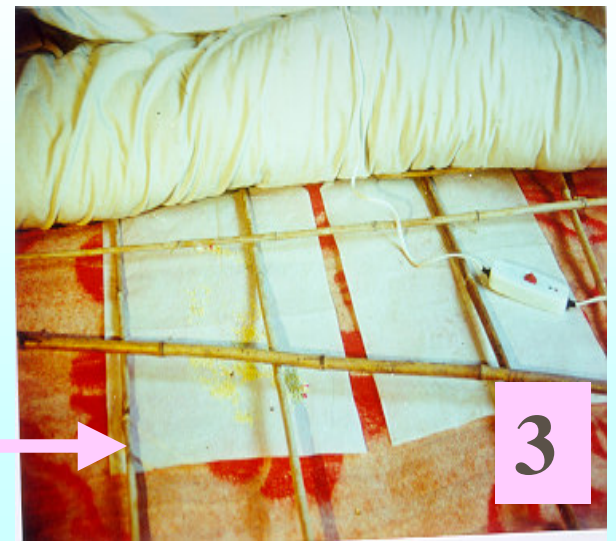
They dry pollen  
by...

1. spreading it out  
in the sun



2. placing it in card  
board boxes  
fitted with 20 W  
electric bulb

3. using electric  
blankets





# Hand Pollination of Apples in Maoxian County, China

Farmers apply dried pollen to flowers of the main variety (within 2-3 days after extraction) with the help of brushes; reach distant flowers by climbing up on the trees and using brushes with long sticks



Beekeeping common but not used for pollination



## II. Estimation of Pollinator Populations



**To generate hard data that can be used as baseline information to monitor the status and trends of pollinators in future**



# Honeybee Species Diversity in the HKH Region



← *Apis cerana*

*Apis dorsata* →



← *Apis florea*

*Apis laboriosa* →



In addition, *Apis mellifera* has been imported and promoted for honey production in the region

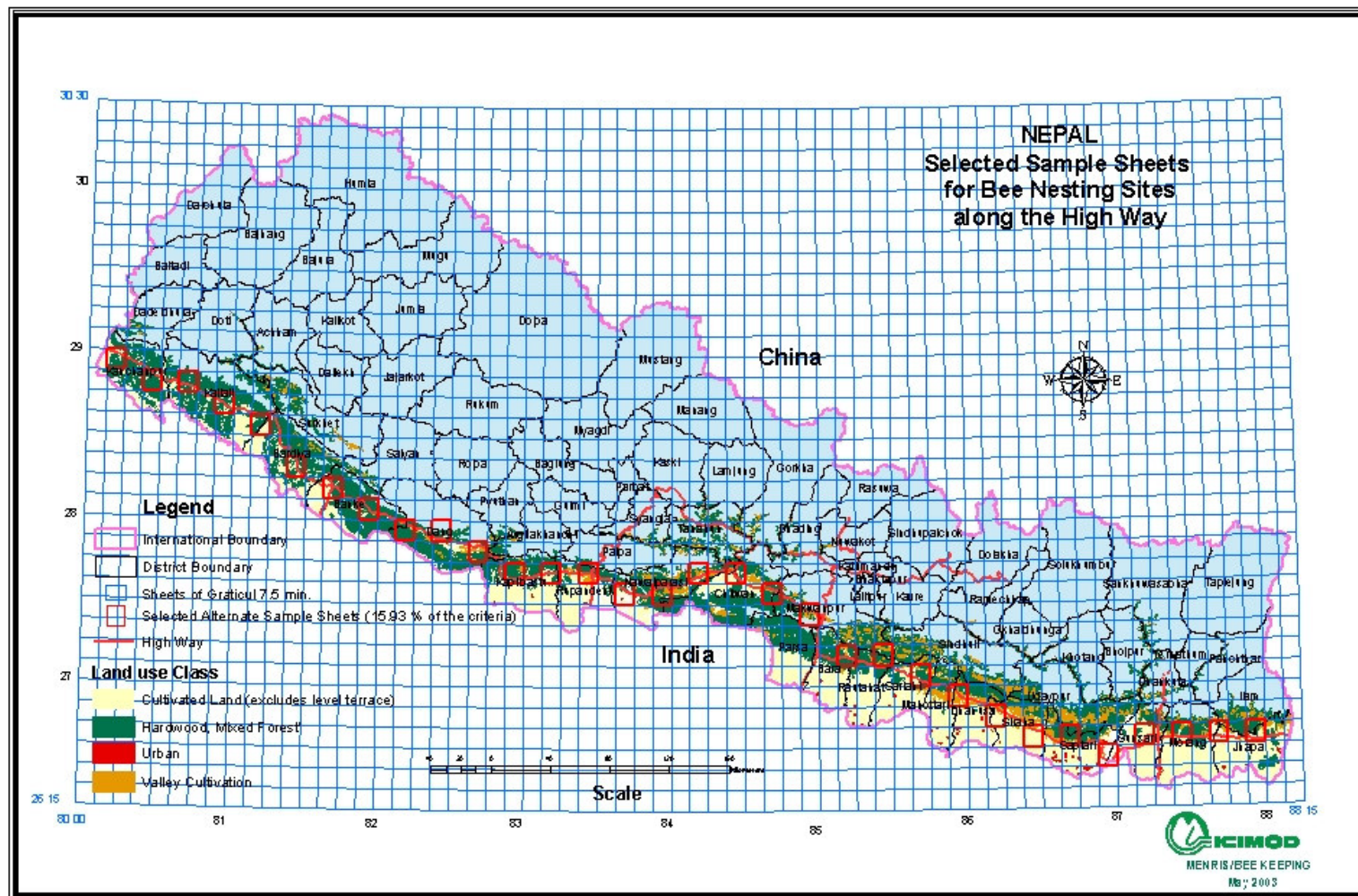
# Development of Methodology for Estimating the Number of *Apis dorsata* Nests in Nepal

- Methodology for estimating the number of nests of *Apis dorsata* in Nepal developed
- It combines field surveys, farmers interviews, use of systems tools such as GIS and GPS and statistics
- Data on altitude, land use, temperature, nesting sites preferred by *Apis dorsata* fed to the computer to generate maps of the potential nesting areas
- About 16 per cent of the total areas is randomly selected and surveyed to count the number and map the geographical position of bee nests (longitude, latitude and altitude) through GPS

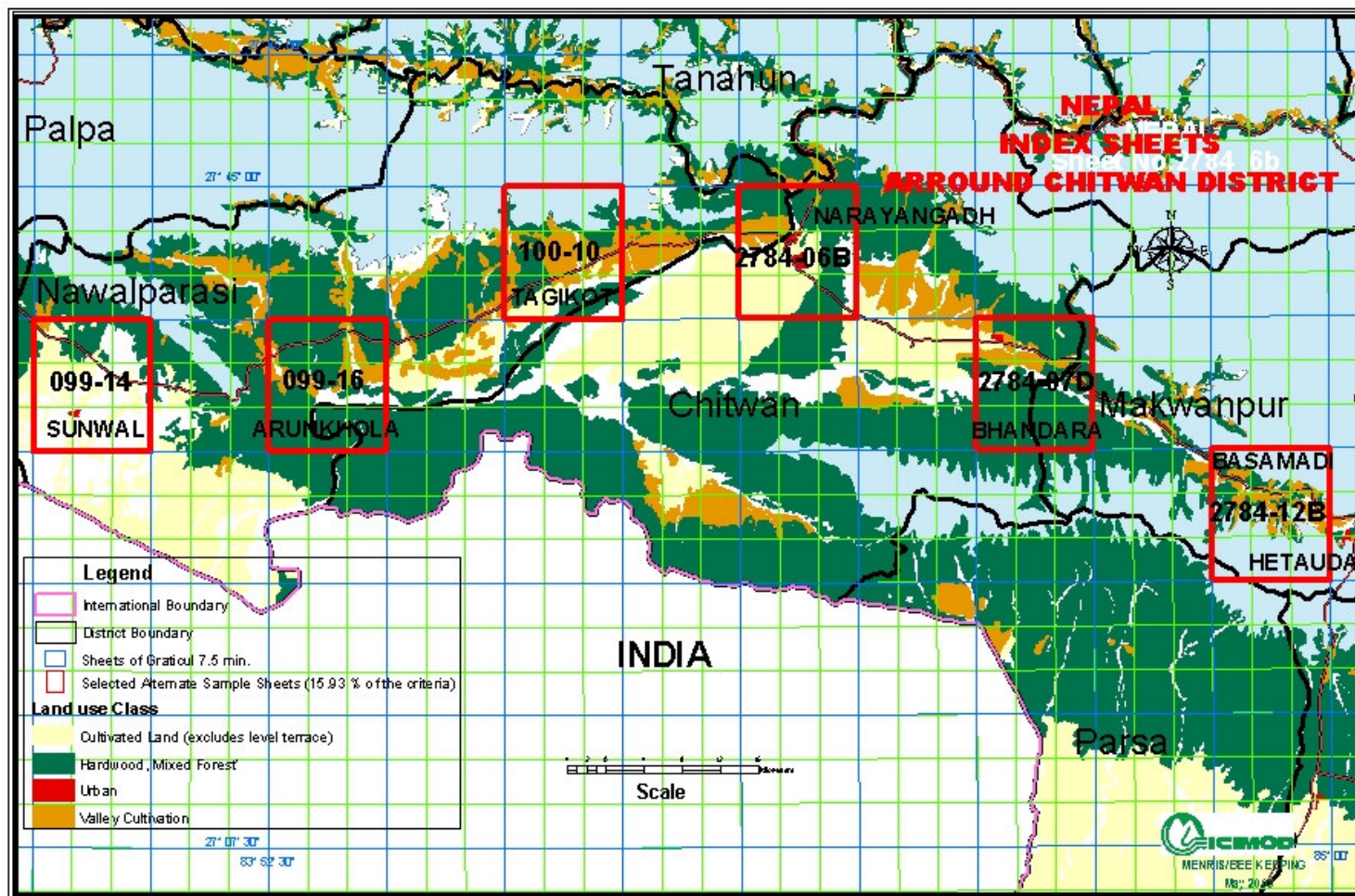


# Nepal Map Showing *Apis dorsata* Nesting Area

## Red blocks are the sample areas for field surveys



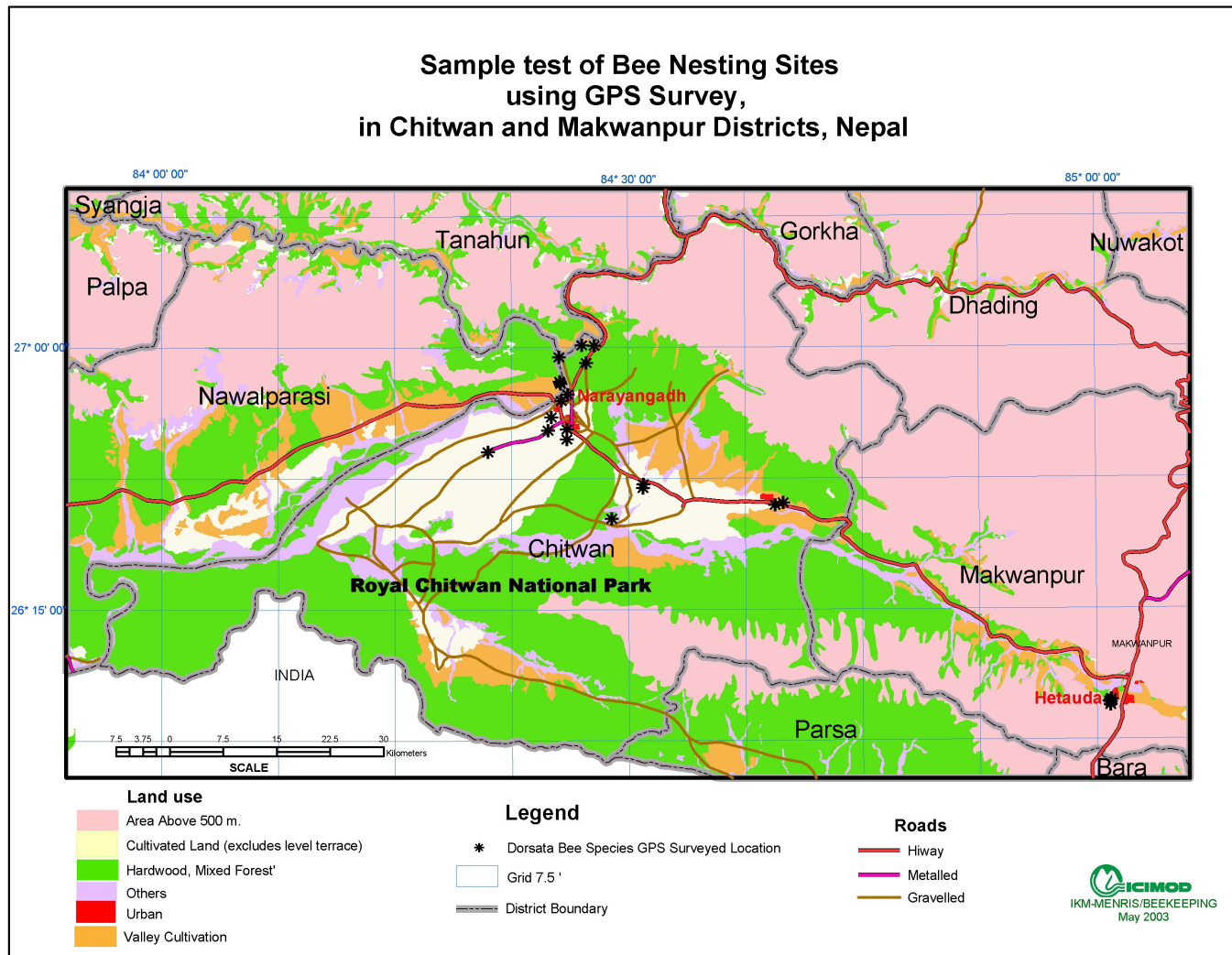
# A Close Up of Selected Sample Sheet for *Apis dorsata* Field Survey





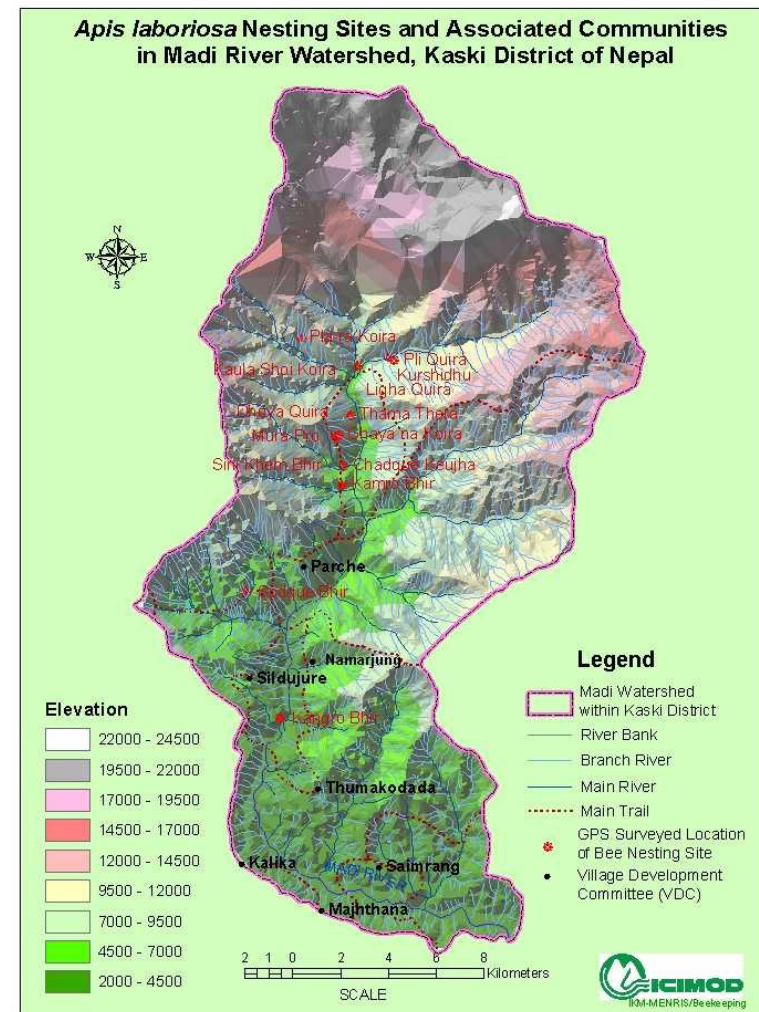
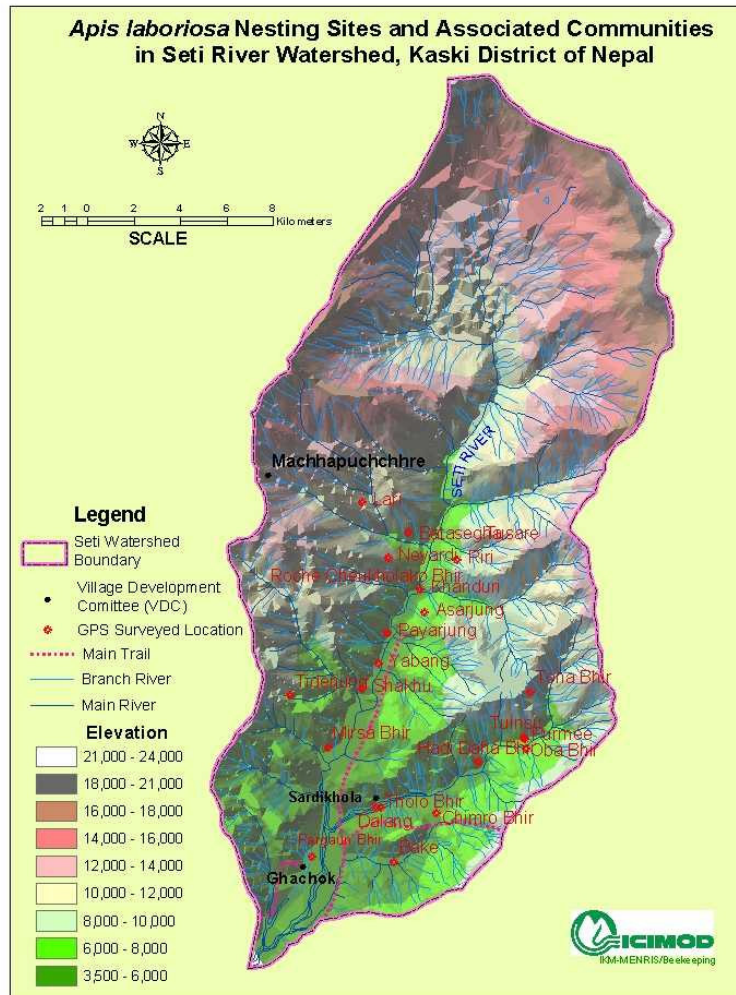
# Findings of the Preliminary Survey

## Nesting Sites of *Apis dorsata* in Chitwan District





# Nesting Sites of *Apis laboriosa* in Seti and Madi River Valleys of Kaski District (Source: Joshi et. al. 2003)





# III. Action Research



# Farmer-participatory action research into:

- The selection and multiplication of indigenous *Apis cerana*
- The impact of honeybee pollination on apple yield and quality and
- The factors affecting pollinator activities and pollination



## IV. Capacity Building and Training

- Setting up pollination demo and research sites and involving farmers as partners in action research in different villages
- Training materials such as manuals, posters, hand outs in English and regional languages
- Training farmers and extension workers on the role of honeybees in enhancing farm productivity through their pollination services
- Supervising Ph.D. research, enhancing capacities of staff and partners by facilitating exchange visits and providing platform to share knowledge and information



## V. Awareness Raising

- Producing awareness materials such as briefing papers, issue papers, discussions papers and newspaper articles and video films
- Setting up demo farms and organising pollination awareness camps in different villages for farmers
- Producing/ translating relevant literature into regional languages





## VI. Networking



- Informal networking of individual researchers and institutions working on pollination in the region
- Provide platform for sharing knowledge and information
- Created “**APINET – Nepal**” - a formal Network of Beekeepers and Beekeeping Institutions in Nepal

**Thank You**