HBRTC

PANTNAGAR

जी.बी. पंत कृषि एवं प्रौद्योगिकी विश्वविद्यालय, पंतनगर, उत्तराखंड

Executive Summary

Recommendation

The present work was guided by five primary objectives *viz.* **women empowerment through beekeeping; entrepreneurship development; promotion of beekeeping and natural resource utilization; promotion of pollination and biodiversity; and production of Quality apicultural products**. These objectives were achieved in two years.

Beekeeping in Uttarakhand: A Sweet Symphony of Nature, Tradition, and Progress

- Uttarakhand contributes **2.33%** to the production of honey in India as it ranks 8th in total honey production in India.
- Before **2022** the honey production was **2200 MT** in Uttarakhand
- After support and inspiration of Hon'ble governor the production has reached to **14210.99 MT** with **81375 bee colonies** actively engaged in the practice.
- Uttarakhand saw an increase in honey production from the past two consecutive years by **7.41% & 3.57%.**
- Uttarakhand has the potential to produce more organic/pollution-free honey due to its forest cover of **45.44%** and improved scientific beekeeping practices.
- Beekeeping has been a traditional practice in Uttarakhand, primarily using the indigenous ***Apis cerana***.
- Bees play a crucial role in pollination, supporting biodiversity and food security. However, bee populations are declining due to climate change, habitat loss, and pesticide use.

Beekeeping potential for sustainable agriculture

Fruit crops highlights:

- Total area for fruit cultivation is **81,692.58 ha (2022-23)** and total fruit production is **369,447.30 tonnes**.
- With involving bees as pollinator, additional **33% increment** in fruit production is expected *i.e..*, **121,917.61 tonnes**.
- The fruit production after incorporating beekeeping will increase to **491,364.91 tonnes, due to improved pollination.**
- A total of **245,077.74 bee boxes** will increase (3 boxes per ha) to support the increased production from **81375 bee colonies**.
- **Apples** current production is **43,328.86 tonnes** and with bee pollination, a 33% increase **(14,298.52 tonnes)** in fruit production is expected and a total fruit production of 57,627.38 **tonnes**.
- **Mango** current production is **113,409.81 tonnes**and with bee pollination, a 33% increase **(37,425.24 tonnes)** in fruit production is expected and a total fruit production of 150,835.05 **tonnes**.

- **Peach** current production is **36,239.19 tonnes** and with bee pollination, a 33% increase (**11,958.93 tonnes**) in fruit production is expected, resulting in a total fruit production of **48,198.12 tonnes**.
- **Pear** current production is **20,607.16 tonnes** and with bee pollination, a 33% increase (**6,800.36 tonnes**) in fruit production is expected, resulting in a total fruit production of **27,407.52 tonnes**.
- **Plum** current production is **12,619.46 tonnes** and with bee pollination, a 33% increase (**4,164.42 tonnes**) in fruit production is expected, resulting in a total fruit production of **16,783.88 tonnes**.
- **Apricot** current production is **8,763.01 tonnes** and with bee pollination, a 33% increase (**2,891.79 tonnes**) in fruit production is expected, resulting in a total fruit production of **11,654.80 tonnes**.

Vegetable crop highlights

- **Total area** under **vegetable cultivation** is **112,607.09 ha ((2022-23)** and **total vegetable production** is **964,109.18 tonnes.**
- With involving bees as pollinators, an additional **33% increment** in vegetable production is expected, *i.e.*, **318,156.03 tonnes.**
- The vegetable production after incorporating beekeeping will increase to **1,282,265.21 tonnes,** due to improved pollination.
- A total of **337,821.27 bee boxes** will be required **(3 boxes per ha)** to support the increased production from **81,375 bee colonies**.
- **Potato** current production is **501,786.64 tonnes** and with bee pollination, a **33% increase (165,590 tonnes)** in vegetable production is expected, resulting in a **total vegetable production** of **667,376 tonnes.**
- **Tomato** current production is **62,855.77 tonnes** and with bee pollination, a **33% increase (20,742 tonnes)** in vegetable production is expected, resulting in a **total vegetable production of 83,598 tonnes.**
- **Onion** current production is **41,761.29 tonnes** and with bee pollination, a **33% increase (13,781 tonnes)** in vegetable production is expected, resulting in a **total vegetable production of 55,543 tonnes.**
- **Pea** current production is **81,510.32 tonnes** and with bee pollination, a **33% increase (26,898 tonnes)** in vegetable production is expected, resulting in a **total vegetable production of 108,409 tonnes**.

Expected outcome

- ✓ The total geographical area (TGA) of Uttarakhand is **5,350,000 ha**.
- ✓ Uttarakhand has **749,000 has** of cultivable land **(14% of TGA)**. By using 8 boxes/ha, this land can support **5,992,000 bee boxes**.
- ✓ The honey production from the cultivable land could be **5,99,20,000 kg** or **5,9920 MT**, with an average of **10 kg of honey per bee box**.
- ✓ Uttarakhand's **forest land** spans **3,26,3500 has**, supporting **3,26,35,000 bee boxes**.
- ✓ The expected honey produced from the forest land as **organic honey** could be **3,26,35,000 kg** or **3,26,350 MT**, with an average of **10 kg of honey per bee box**.
- ✓ Beekeeping significantly improves pollination, leading to increased yields and quality of crops, fruits, and vegetables. This is crucial in Uttarakhand's agricultural landscape.

- ✓ This enhanced pollination supports the biodiversity of local flora.
- ✓ Beekeeping promotes a healthy ecosystem by supporting the natural pollination process.
- ✓ It encourages sustainable agricultural practices, reducing reliance on chemical pesticides.
- ✓ Beekeeping provides a viable source of employment, particularly in rural areas, helping to curb migration to urban centers.
- ✓ It creates opportunities for beekeepers, honey processors, and those involved in related industries like equipment manufacturing.
- ✓ Government initiatives like the "Maun Palan Yojana" encourage self-employment among youth through beekeeping, providing financial support and training.
- ✓ Honey production and the sale of other bee products (beeswax, propolis, etc.) provide a valuable source of supplementary income for farmers and rural households.
- ✓ This contributes to economic diversification and resilience.
- ✓ The growing demand for honey and honey-based products in India presents a significant market opportunity for Uttarakhand beekeepers.
- ✓ The potential for organic honey production in Uttarakhand's pristine environment adds further value.
- ✓ Increased income from beekeeping contributes to improved living standards, including better access to education, healthcare, and other essential services.
- ✓ Beekeeping promotes community involvement and cooperation, fostering social development in rural areas.
- ✓ By creating jobs and adding income to rural families, this practice can greatly reduce poverty within the region.
- ✓ Continued government initiatives, financial assistance, and training programs are crucial for the success of beekeeping promotion.
- ✓ Providing beekeepers with the necessary skills and knowledge through training programs is essential for adopting modern and sustainable beekeeping practices.
- ✓ Establishing strong market linkages for honey and other bee products is vital for ensuring fair prices and sustainable income for beekeepers.

In essence, the intensification and promotion of beekeeping in Uttarakhand offer a pathway to sustainable development, economic empowerment, and improved livelihoods for the region's people.

Case study/Impact of women empowerment project in Uttarakhand

The Role of Beekeeping in Sustainable Agriculture and Rural Development

- Beekeeping aligns with sustainable agriculture by enhancing pollination, improving crop yields, and promoting biodiversity.

- Beekeeping provides rural households with a sustainable source of income, reducing dependence on resource-intensive farming.
- Experiments in Almora, Kotabagh, and Sitarganj showed that beekeeping significantly increased crop yields, such as apples, mustard, and sunflowers.
- Beekeeping supports the conservation of native bee species and promotes the planting of bee-friendly crops.
- Beekeeping is a climate-resilient livelihood option, as bees can adapt to changing environmental conditions.

Impact of Beekeeping on Women Empowerment

- In Almora **19 participants** registered and **14 reported increased income**, with an average incremental income of **Rs. 93,071** annually.

- In Kotabagh **20 participants** registered and **9 reported increased income**, with an average incremental income of **Rs. 18,333** annually.
- In Sitarganj **50 participants** registered and **26 reported increased income**, with an average incremental income of **Rs. 12,461** annually

- **75 master trainers** got developed.
- Women like Nirmala Singh Fartiyal, Devki Devi, and Bhawna Karki have become successful beekeepers, inspiring others in their communities.

Challenges: Women faced challenges such as lack of initial capital, access to markets, and fear of bee stings, which were addressed through training and support.

Pre and Post Evaluation on different aspects of beekeeping

Particulars	Pre-evaluation	Post-evaluation
General information about beekeeping	5.26	89.47
Knowledge about Different species of honey bee	19.29	94.73
Economic aspect of beekeeping	15.78	84.21
Family organization of honeybees	10.52	100
Working of honeybees	5.26	94.73
Diseases and pest management	0	94.73
Economic use of honey bee products like (honey, bee wax, propolis, pollen, royal jelly)	7.89	94.73

Economic Aspects of Beekeeping

- Beekeeping is a **highly profitable and sustainable livelihood option** for rural communities in Uttarakhand.
- It provides a **reliable source of income**, especially for women-led households, complementing traditional agricultural activities.

- The production of **honey, beeswax, propolis, and other apicultural products** opens up new revenue streams, improving financial stability and enabling investment in the future.

- Beekeeping stimulates **local economies**, creates jobs, and reduces poverty in rural areas.
- It requires **minimal land and resources**, making it an accessible and low-risk investment for rural families.

Net Income through 100 *Apis mellifera* bee colonies

Total expenditure	**Values (Rs.)**
Recurring	166000
Non-recurring	300000
Grand total	466000
Total income	1375000
Expenditure	466000
Net profit	**909000**

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Promotion of Pollination and Biodiversity

The research also included a series of experiments to study the impact of pollinators, particularly honey bees, on apple crop yields in Matila village, Almora. The experiments compared three treatments: **Open Pollination**, **Bee Pollination**, and **Exclusion** (no pollinators).

Close pollination Flowers Open pollination

Key Findings:

1. **Impact of Pollination on Apple Yield:**

- **Open Pollination** resulted in the highest number of set fruits, mature fruits, fruit weight, and overall yield, followed by **Bee Pollination**.
- **Exclusion** (no pollinators) led to the lowest yields, highlighting the critical role of pollinators in apple production.

2. **Foraging Activity of Pollinators:**

    - ***Apis cerana*** (Indian honey bee) showed the highest foraging activity, peaking at 10:00 am.
    - Other pollinators like *Bombus haemorrhoidalis* and *Eristalis* species also contributed to pollination but to a lesser extent.
    - Pollinators from the **Apidae family** (honey bees and bumblebees) were the most active, followed by **Syrphidae** (hoverflies) and **Coccinellidae** (ladybugs).

3. **Pollinator Visits and Population Share:**

    - **Apidae family** accounted for **31.08%** of pollinator visits, with *A. cerana* being the most prominent.
    - **Syrphidae family** contributed **20.46%** of visits, with *Eristalis* species being the most active.
    - **Coccinellidae family** (ladybugs) also played a significant role, contributing **33.34%** of visits.

Category	**Area (ha)***	**Total Bee Boxes accompanied (8 or 10 boxes/ha)****	**Total honey production kg or MT (10 kg/bee box)**
Total geographical area	5,350,000.00	-	-
Cultivable land	749,000.00	5,992,000.00	59920000.00 kg or 59,920.00 MT
Forest land	3,263,500.00	32,635,000.00	326,350,000.00 kg or 3,26,350 MT

*The values are taken from State Horticulture Mission, Gov. of Uttarakhand. **These are calculated values. 8 boxes/ha for cultivable land and 10 boxes/ha for forest.
Source: State horticulture Mission, Gov. of Uttarakhand
https://shm.uk.gov.in/pages/display/6-state-profile

Fruit Production (2022-2023) with 33% Increment and Bee Box Requirements

S.No.	**Fruit**	**Crop Cultivated Area (has)***	**Current Production (tonnes)***	**33% Increment in Production (tonnes)****	**Production with Beekeeping (tonnes)****	**Bee Boxes Required (3 boxes/ha)****
1	**Apples**	11,327.33	43,328.86	14,298.52	57,627.38	33,981.99
2	**Pear**	3,745.22	20,607.16	6,800.36	27,407.52	11,235.66

3	**Peach**	5,518.84	36,239.19	11,958.93	48,198.12	16,556.52
4	**Plum**	2,625.48	12,619.46	4,164.42	16,783.88	7,876.44
5	**Apricot**	2,303.72	8,763.01	2,891.79	11,654.80	6,911.16
6	**Walnut**	5,681.43	9,683.20	3,195.46	12,878.66	17,044.29
7	**Citrus**	9,992.11	36,911.96	12,180.95	49,092.91	29,976.33
8	**Mango**	21,050.41	1,13,409.81	37,425.24	1,50,835.05	63,151.23
9	**Litchi**	5,218.59	19,068.81	6,292.71	25,361.52	15,655.77
10	**Anola**	987.83	3,918.70	1,293.17	5,211.87	2,963.49
11	**Guava**	4,690.32	37,697.96	12,440.33	50,138.29	14,070.96
12	**Other fruits**	8,551.30	27,199.18	8,975.73	36,174.91	25,653.90
13	**Total**	**81,692.58**	**3,69,447.30**	**1,21,917.61**	**4,91,364.91**	**2,45,077.74**

*The values are taken from State Horticulture Mission, Gov. of Uttarakhand. **These are calculated values.

Source: State horticulture Mission, Gov. of Uttarakhand https://shm.uk.gov.in/pages/display/186-horticulture-production-data

Vegetable Production with 33% Increment and Bee Box Requirements

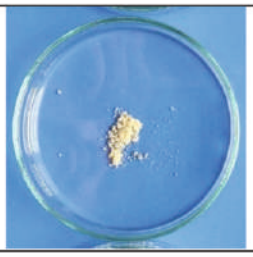
S.No.	Vegetable	Crop Cultivated Area (has)*	Current Production (tonnes)*	33% Increment (tonnes)**	Production with Beekeeping (tonnes)**	Bee Boxes Required (3 boxes/ha)**
1	**Pea**	11,564.07	81,510.32	26,898	1,08,409	34,692
2	**Radish**	4,145.50	37,157.89	12,262	49,420	12,437
3	**French bean**	4,433.35	23,352.08	7,706	31,058	13,300
4	**Cabbage**	4,778.93	46,854.18	15,462	62,316	14,337
5	**Onion**	4,011.09	41,761.29	13,781	55,543	12,033
6	**Bell Peppers**	2,166.78	11,439.27	3,775	15,214	6,500
7	**Okra**	2,969.76	19,444.87	6,417	25,862	8,909
8	**Tomato**	5,274.66	62,855.77	20,742	83,598	15,824
9	**Brinjal**	2,045.84	22,536.08	7,437	29,973	6,138
10	**Potato**	58,268.28	5,01,786.64	1,65,590	6,67,376	1,74,805
11	**Other vegetables**	12,948.83	1,15,410.79	38,086	1,53,496	38,846
12	**Total**	**1,12,607.09**	**9,64,109.18**	**3,18,156.03**	**12,82,265.21**	**3,37,821.27**

*The values are taken from State Horticulture Mission, Gov. of Uttarakhand. **These are calculated values.

Source: State horticulture Mission, Gov. of Uttarakhand https://shm.uk.gov.in/pages/display/186-horticulture-production-data

Production of Quality Apicultural Products

- The production of high-quality honey, beeswax, propolis, pollen, and royal jelly requires a combination of traditional practices and modern quality control measures.
- Quality control lab was established to test and certify the quality of apicultural products, ensuring they meet market standards.

S.No.	Bee Product	
1.	Honey ✓ Highly nutritious and energetic. ✓ 3150-3350 calories/kg honey while 620 cal. from cow's milk. ✓ Useful for soothing sore throats. ✓ Mild salve for treating skin conditions, burns, cuts and abrasions. ✓ Due to its acidity honey is anti-bacterial. ✓ An antioxidant.	
2.	Royal Jelly ✓ Milky secretion, secreted by nurse bees from hypopharyngeal glands. ✓ Strongly acidic and highly nutritious. ✓ It is the key factor of queen determination. ✓ Antibacterial, anti-cancerous agent, anti-aging agent, and skin care ingredient	
3.	Bee wax ✓ Used in cosmetics, candles and beekeeping. ✓ Cosmetics: Creams, lotions, lipstick. ✓ Candles: Flammable and has been used to. make candles ✓ Beekeeping: Foundation beeswax.	
4.	Bee venom ✓ Apitoxin is acidic (4.5-5.5). ✓ 0.3 mg of venom is produced by adult worker. ✓ Honeybee can inject 0.1 mg venom.	

- Adulteration, pesticide contamination, and lack of awareness are major challenges in producing high-quality products.
- There is significant market potential for apicultural products, driven by increasing consumer demand for natural and organic products.

Training Paramilitary Forces in Beekeeping

- A specialized training program was conducted for paramilitary forces (CRPF, ITBP, CISF) to equip them with beekeeping skills for supplementary income and environmental conservation.

- The program aimed at personal development, environmental stewardship, and community engagement.
- **149 armed officers** got trained through the trainings.
- **Impact**: Participants gained practical skills in beekeeping, enhancing their environmental awareness and providing them with a source of supplementary income.
- **Role of Paramilitary Forces**: Paramilitary forces can promote beekeeping in remote and border areas, contributing to rural development and environmental conservation.

Promoting Sustainable Development and Empowering Rural Communities

- Beekeeping aligns with several UN Sustainable Development Goals (SDGs) such as **SDG-1: No poverty, SDG-2: Zero hunger, and SDG-15: Life on land**; including poverty reduction, food security, and biodiversity conservation.
- Beekeeping has empowered rural women, providing them with a sustainable source of income and enhancing their social status.
- Addressing challenges such as lack of technology and climate change presents opportunities for growth and innovation in the beekeeping sector.

Recommendations

Constitution of State Bee Board Policy

The establishment of a "State Bee Board" policy signifies a crucial step towards harnessing the multifaceted potential of beekeeping for both agricultural advancement and economic empowerment. Recognizing the vital role of honeybees in pollination and ecosystem health, this policy aims to create a structured framework for the sustainable development of apiculture within the state. Honeybees are indispensable pollinators, significantly contributing to the yield and quality of numerous crops. A dedicated Bee Board policy will facilitate the integration of beekeeping practices into mainstream agriculture, thereby boosting overall productivity. Beekeeping offers a viable avenue for income generation, particularly in rural areas. A well-defined policy can support the development of a thriving apiculture industry, creating employment opportunities and fostering entrepreneurship. By promoting responsible beekeeping practices, the policy will contribute to the preservation of biodiversity and the maintenance of ecological balance. It will also help to protect and increase the populations of bees. A State Bee Board provides a centralized body to oversee and coordinate beekeeping activities, ensuring the implementation of standardized practices, quality control, and effective resource management.

A state bee board can provide the needed regulation for bee keeping practices within the state. This can help to prevent the spread of bee diseases, and to also ensure the quality of honey

and other bee products. In essence, the "State Bee Board" policy represents a strategic investment in the sustainable growth of beekeeping, with far-reaching benefits for agriculture, the economy, and the environment.

OBJECTIVES:

1. **To Establish Uttarakhand as a Leader in Apiculture:**
    - Position Uttarakhand as a leader in honey production within India ("spearhead of sweet revolution").
    - Optimize the utilization of the state's natural resources for sustainable beekeeping.
    - Leverage the production of medicinal honey to maximize market returns.
    - Create sustainable employment opportunities for women and unemployed youth.
    - Generate supplementary income for farmers.
2. **To Advance Beekeeping Practices:**
    - Promote and adopt scientific bee management practices.
    - Increase public awareness about the benefits of honey and other beehive products, thereby increasing per capita consumption.
    - Raise awareness about the critical role of bees in crop pollination.
    - Enhance crop productivity by facilitating access to honeybee pollination services for farmers.
    - Maintain ecological balance by conserving and promoting beekeeping practices.
3. **To Strengthen the Beekeeping Infrastructure:**
    - Establish and maintain small apiaries for demonstration, pollination, honey extraction, and promoting beekeeping practices.
    - Provide technical training programs and short-term courses in beekeeping for farmers.
4. **To Develop a Robust Beekeeping Industry:**
    - Foster holistic growth of the beekeeping industry to generate income and employment.
    - Develop essential infrastructure, including:
        - Quality nucleus stock development centers.
        - Bee breeder multiplication programs.
        - Disease diagnostic laboratories.
        - Integrated Beekeeping Development Centers (IBDCs) and Centers of Excellence (CoEs).
        - Beekeeping equipment manufacturing units.
        - Post-harvest and marketing infrastructure (processing plants, storages, collection centers, branding, marketing hubs).
    - Establish state-of-the-art quality control laboratories at regional levels and mini/satellite labs at district levels.

- Develop a blockchain-based traceability system for honey and other beehive products.
- Integrate IT tools into beekeeping operations (online registration, data management).
- Promote the creation of "Honey Corridors" in suitable areas.
- Support agri-entrepreneurs and agri-startups involved in beekeeping.
- Facilitate trade agreements between beekeepers, traders, processors, and exporters.
- Promote, develop, and disseminate the latest beekeeping technologies and best practices.
- Invest in skill development programs for beekeepers.

State Plan:

Constitution of the State Bee (Beekeeping Entrepreneurship Excellence) Board

The State Bee Board shall be constituted with the following members:

- **Chairperson:** Minister of Horticulture/ Agriculture, Government of Uttarakhand.
- **Members:**
  - Eminent scientists specializing in apiculture research.
  - Renowned beekeepers with expertise in beekeeping within the state.
  - A representative from the Finance Department of the Government of Uttarakhand.

Organizational Structure:

The State Bee Board shall have a dedicated head office comprising four distinct departments:

- Administrative Department
- Processing Department
- Quality Regulation Department
- Marketing Department

Leveraging G.B. Pant University:

Given the existing infrastructure and expertise at the G.B. Pant University's Honey Bee Research and Training Center (92 acres), it is recommended to establish the following departments within the University:

- State-level Research Laboratory
- Bee Product Processing Unit
- Quality Control Laboratory
- Marketing Department (for the State Bee Board)

This strategic location offers several advantages:

- Ample land space for building infrastructure and conducting research trials.
- Access to a pool of qualified research scholars for research and quality control.

Enhanced Responsibilities for the State Bee Board

The State Bee Board should assume the following key responsibilities:

1. **Beekeeper Registration & Membership:**
   - Mandate online registration for all state beekeepers.

- Issue unique identification numbers (IDs) to registered beekeepers, granting them official membership of the State Bee Board.

2. **Employee Training:**
   - Implement comprehensive training programs for all State Bee Board employees.
3. **Full-Time Staffing:**
   - Recruit and maintain a permanent staff of skilled professionals, including scientists, for the head office.
4. **Product Procurement & Quality Assurance:**
   - Source bee products exclusively from registered beekeepers to ensure quality and authenticity.
   - Conduct mandatory field testing of all procured products.
5. **Price Determination:**
   - Establish the authority to determine fair and competitive prices for bee products within the state.
6. **Adequate Funding:**
   - Secure sufficient funding to facilitate the purchase of bee products, particularly honey, based on rigorous quality checks.
7. **State-of-the-Art Laboratory:**
   - Operate a well-equipped state laboratory for quality testing of bee products sourced from registered beekeepers.
   - Implement a system for branding all approved bee products with the State Bee Board logo.
8. **Marketing & Distribution:**
   - Collaborate with the Horticulture and Agriculture departments to establish a network of retail outlets in key tourist destinations and urban centers for the sale of branded bee products.

Key Considerations:

- Brand Building: Emphasize the "Uttarakhand" brand to enhance the credibility and marketability of state-produced bee products among consumers.
- Regulatory Compliance: Ensure all bee products adhere to stringent quality standards and regulatory guidelines.
- Support for Beekeepers: Provide ongoing support and resources to beekeepers, including training, technical assistance, and access to markets.

Strengthening of HBRTC, G.B. Pant University of Ag and Tech Pantnagar:

1. HBRTC has been established with an outlay of 92 acres area for promotion and training of beekeeping.
2. Since the HBRTC Pantnagar is the first and foremost Centre on beekeeping having huge infrastructure and human resources should be conserved and preserved as heritage of the state and the infrastructure should be expanded and strengthen to create awareness in bid to promote the beekeeping in state and to promote Api-tourism in the state.
3. HBRTC Pantnagar should be recognised as Head Quarter of State Bee Board Uttarakhand.

4. The HBRTC Pantnagar should have its administrative building for conducting all the activities in the state.

Division in two Zones

Based on geographical location, the state is already geographically and politically divided in two different zone Kumaun and Garhwal region. One coordination center should be established in each region to organise programme, accelerate activities, facilitate farmers and monitor various activities in the region.

District and Block level activities

- Uttarakhand State comprises of 02 regions 13 districts, 78 Tehsils and 95 community development blocks. The districts lying in **Garhwal Region** are Uttarkashi, Chamoli, Pauri, Rudraprayag, Tehri, Dehradun & Haridwar and the remaining 06 in **Kumaon Region** are Udham Singh Nagar, Nainital, Almora, Pithoragarh, Champawat & Bageshwar.
- **Seven Days Training**: Training in beekeeping is provided by the State Bee Board to the farmers of Uttarakhand.
- **Bee keeping equipments/material** is provided to the farmers with a subsidy support to the marginal, small and SC/ST category.
- **Pollination service**.The department of horticulture helps the farmers by providing honey bees for pollination at nominal rent at the time of flowering.
- **Demonstration and technical know-how** Government beekeeping stations (now migratory) are functioning in every district and these stations are serving as a demonstration apiary and provide training and technical know-how to the farmers. The detail of the govt. bee keeping stations in the State is as under.

ACTIVITIES TO BE CARRIED OUT:

1. State Bee Board should constitute to survey the state and submit the report regarding potential area and status of beekeeping in the state.

2. Identification and selection of potential areas of beekeeping in Uttarakhand.

3. Conducting Awareness Program: - State beekeeping board will organize the awareness program through institutions/ NGOs who are working in beekeeping development, rural development, agricultural activities.

4. Convergence with those working on beekeeping viz. NGO/organizations/ Scientists to promote the beekeeping activity in a larger prospective with overall development in terms of adopting scientific beekeeping practices.

4. Organizing skill development program: -

1. The field offices will organize skill development program of 05 days through SBECs (state beekeeping extension centers), Beekeeping NGOs in which the beneficiaries will be trained about the methodology of beekeeping activities, Maintenance and handling of bee colonies, Information pertaining to flora calendar, techniques of migration of the bee colonies.

5. Handholding support: - The field offices have extended handholding supports to the successful trained beneficiaries for honey extraction and multiplication of bee colonies through Master Trainers 6. Distribution of bee boxes with bee colonies and tool kits: - The field offices have distributed the bee boxes with live bee colonies and other tool kits to the trained beneficiaries, as per the targets allocated to them, to start practically the beekeeping activity at their places.

7. Marketing tie up: - The field offices organized buyer –seller meet for honey and other bee hive products for making available marketing platform and processing the raw honey through Institutional Honey Processing Plants.

8. Cluster formation: - The beekeeping cluster formation of interested beekeepers for availing the services under common Facility Center with the facilities for Honey Processing, Testing Lab, Packing, Branding and Market promotion available.

Under the Horticulture Mission, there is a provision of providing 50 per cent subsidy on the production of bee colonies to the beekeepers.

Outputs of Beekeeping

These outputs highlight the multifaceted benefits of promoting beekeeping in Uttarakhand, contributing to economic growth, agricultural sustainability, and the overall well-being of the region's inhabitants.

Economic Benefits:

- **Additional Income Generation:**
  - Provides a supplementary income source, especially for rural households.
  - Creates opportunities for small farmers and landless individuals.
  - Diversifies income streams, enhancing economic resilience.
- **Employment Generation:**
  - Fosters self-employment opportunities, particularly for unemployed youth.
  - Supports the development of related industries (e.g., hive construction, honey processing, marketing).
  - Creates jobs within the value chain of honey and bee product production.
- **Market Growth:**
  - Capitalizes on the expanding Indian honey market.
  - Enables entrepreneurs to establish profitable ventures in apiculture.
  - Increased sales of honey, beeswax, propolis and other bee products.

Agricultural/horticultural Benefits:

- **Enhanced horticultural/Agricultural Productivity:**
  - Improves crop pollination, leading to increased yields.
  - Supports sustainable agriculture practices.
  - Promotes the health of local flora.

Social and Environmental Benefits:

- **Upliftment of Living Standards:**
  - Contributes to the economic empowerment of rural communities.
  - Improves the quality of life through increased income and economic stability.
- **Environmental Sustainability:**
  - Supports biodiversity protection through increased pollination.
  - Promotes ecological balance.
  - Bees are indicators of a healthy enviroment.
- **Preservation of Cultural Heritage:**
  - Maintains traditional beekeeping practices.
  - Reinforces the cultural significance of beekeeping in the region.

Governmental Support and Development:

- **Government Initiatives:**
  - Facilitates access to subsidies and financial assistance Provides training and educational programs for beekeepers.
  - Government support through programs to provide bee boxes and other needed supplies.
- **Skill Development:**
  - Improves beekeeping knowledge and skills through training programs.
  - Promotes the adoption of modern beekeeping practices.

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