Best Practice-2

1. **Title of the best practice: Plantation Programme in Herbal Garden and Campus**
2. **Objectives of the practice:**

The novel objective of the programme is to save our planet and mother earth by plantation. Therefore now we have to maintain this by following:

- To plant the different fruits, medicinal plants and rare plants in campus.
- To enhance the value of plant of fruits, medicinal herbs, rare plants among students, faculty and local people.
- To conserve rare variety of plants and to popularize the traditional knowledge of commonly available medicinal plants.
- To create the interest among the students, regarding trees and plants.
- Maintenance of herbal garden at college premises with medicinal and aromatic plants
- To create awareness among students about medicinal plants and their uses.
- To popularize the use of commonly available medicinal plants and to conserve the associated traditional knowledge in sustainable manner.

3. **Context:**

In our college lots of rare variety plants like sandal wood tree, Stone fruit (Rudrakhshya), *Azadirachta indica* (Neem), White Plumeria, wood apple (Belpatri), other rare medicinal herbs, plants of different fruits are available in campus premises. The motive is to sensitize students, teachers, staff and local people to give back to nature and live in an environment conductive to their health and well being and connect people with nature. Herbal gardens play an important role in the conservation of medicinal plants. They help in popularizing the utility of commonly available and frequently used medicinal plants among the people, students, visitors etc. Herbal gardens offer a great opportunity for improving the quality of education and for learning basic life skills. Gardens can serve as a "Laboratory" for the teaching of modern farming skills and nutrition, but they can also be used for practical and applied knowledge and exposure related to botany and other scientific studies. Further, students get the opportunity to experience and learn about the key gardening activities like composting, nursery raising, planting, harvesting and storing of seed etc., and the underlying scientific principles behind all these activities.

4. **The best practice as follows:**

Currently we have more than 100 trees, herbs, ornaments in college premises. These plants are planted in different occasions. The teacher and students plant tree and herbs in their birthday

and other special days like earth day, water day, environment day, local festival like Herela etc. We also honor our guest with a medicinal plant from our herbal garden which is situated in college premises. For prevention of these plants principal Dr. Madhulika Pathak had taken a great initiative by assigning each plant to teacher and student. Now the result of the programme is that every student and staff is participating in plantation programme with great enthusiasm.

For exploration and extension, students along with teachers visited to- Uttarakhand Forest Training Institute, Haldwani; CSIR-CIMAP (Central Institute of Medicinal and Aromatic Plants), Research Center Purara; Him Natural or Bhamri Natural, Chaurson Village, Garur, Bageshwar; and Devaki Vatika, Mandalsera. Ten days training-cum-demonstration programme on Herbal Garden was organized from 27 Feb- 08 March 2022 to educate and train the students and farmers about the importance of various medicinal and economically important plants.

5. **Outcomes:**
   - Plants are growing very well and visitors always appreciate the initiatives taken by the college.
   - Students are acquiring knowledge about plant diversity and its uses.
6. **Evidence of success:**
   - Display boards were installed in herbal garden premise mentioning common name,botanical name & uses. Also, Funding agency board was also installed in herbal garden for acknowledgement.
   - Photographs of all the events organized are taken. The Photos are also displayed on the college website and social media.
7. **Problems Encountered and Resources Required:**
   - Meager Grants.

PLANTATION ACTIVITIES IN THE COLLEGE CAMPUS

Chief Minister Innovation Scheme

Establishment of Herbal Garden

Government Degree College Kanda (Bageshwar), Uttarakhand, India

Coordinator: Dr. Uma Pandey Padalia

Herbal Garden under C.M. Innovation Scheme

Title of the Project: "Establishment of Herbal Garden at Government Degree College Kanda, Bageshwar"

Name of Organization/ Institution: Government Degree College Kanda, Bageshwar

Coordinator: Dr. Uma Pandey Padalia

Funding under scheme: C.M. Innovation Scheme

Sanctioned amount: 03 Lakhs

Background

Herbal gardens play an important role in the conservation of medicinal plants. They help in popularising the utility of commonly available and frequently used medicinal plants among the people, students, visitors etc. Herbal gardens offer a great opportunity for improving the quality of education and for learning basic life skills. Gardens can serve as a "laboratory" for the teaching of modern farming skills and nutrition, but they can also be used for practical and applied knowledge and exposure related to botany and other scientific studies. Further, students get the opportunity to experience and learn about the key gardening activities like composting, nursery raising, planting, harvesting and storing of seed, etc. and the underlying scientific principles behind all these activities.

Objectives:

- Establishment of herbal garden at college premises with medicinal and aromatic plants
- To create awareness among students about medicinal plants and their uses.
- To popularize the use of commonly available medicinal plants and to conserve the associated traditional knowledge in sustainable manner.

Work done

1. **Land development**

   The land was developed including labeling of plots and removing pebble, stones, wooden chunks etc. from the field. Soil testing was done from Soil Testing Lab, Bageshwar. Soil testing report showed lack of carbon and nitrogen in the soil which was replenished using vermin compost and farm yard manure (FYM) etc.


2. **Bed preparation**

   After the land development, 15x30 meter size beds were prepared for the planting of the medicinal plants. Organic manure i.e. vermin-compost, cow urine and farm yard manure was applied in the soil for better growth of plants.

3. **Field-cum-exposure visits**: Field visits of students and staff were conducted in forest nurseries/institution for better learning and exposure to understand different medicinal and aromatic plants.

   3.1. Visit to Forest Training Institute, Haldwani

   Visited to Uttarakhand Forest Training Institute, Haldwani on date 06/02/2022 regarding Herbal Garden Project under C.M. Innovation Scheme. During the visit Mr. Madan Singh Bisht, Forest Range Officer, Uttarakhand Forest Training Institute, Haldwani apprised about the importance of different medicinal plants viz. different conservation status of plants, different concept of conservation of gymnosperm, lichens, moss and high altitude plants and various other commercial viable plants. The conservation status, traditional uses as well as commercial aspects of different plants discussed during the visit. Mr. Madan Singh Bisht also discussed about different models of herbal gardens considering the conservation as well as commercial and entrepreneurship development of students and society for medicinal and commercial



   3.2. Visit to CSIR-CIMAP, Research Center, Purara, Bageshwar

   25 Student along with four teachers of GDC Kanda visited to CSIR-Central Institute of Medicinal and Aromatic Plants (CIMAP), Research Center, Purara, District Bageshwar on 26 March 2022. The Research and Development activities of CIMAP RC Purara were explained to all students. Plantation and Scientific plant propagation processes of medicinal plants were also explained to the students. Nursery preparations, rose water preparation, and cultivation practices on medicinal and aromatic plants, distillation and quality of extracted essential oils from aromatic

crops suitable for hilly areas were demonstrated to students. The various publications and various herbal products and their technologies were also demonstrated to the students.

Some glimpses of the visit at CSIR-CIMAP Purara, Bageshwar

3.3 Visit to Him Natural, Chaurson, Garur, Bageshwar: 29 students of GDC, Kanda with teachers visited to Him Natural or Bhamri Natural is situated in Chaurson village, Garur, Bageshwar. Mr. Chandra Shekhar Pandey is ta progressive farmer and an entrepreneur working on ecotourism and conservation and cultivation of medicinal and aromatic plants. Him Natural have developed various herbal formulation (variety of green teas, natural spices, traditional millets, endemic natural edibles, organic produces with integrated farming).

3.3. Visit to Devaki Vatika, Mandalsera, Bageswar: Students of GDC Kanda with teaching staff visited to Devaki Vatika, Mandalsera. Vatika established by Shri Kisan Singh Malara who is famous in Uttarakhand with the name of "**Vikshya Mitra and Vikshya Purush**". He explained about different types of plants, herbs, shrubs and variety of economic important plants. He also explained about how to grow medicinal plants in different climatic conditions viz. in extreme summer, rainy winter season and also in high altitudes areas. He also apprised the students about silviculture through his innovation on

agriculture practices on mulberry plant and their cultivars. Students were very happy to interact with a distinguished and inspirational person of Uttarakhand who is working for our forest and environment.

कांडा के छात्र-छात्राओं ने देखी देवकी वाटिका

संवाद न्यूज एजेंसी

बागेश्वर। राजकीय महाविद्यालय कांडा के छात्र-छात्राओं ने देवकी लघु वाटिका मंडलसेरा का भ्रमण किया। वाटिका के संस्थापक वृक्षपुरुष किशन सिंह मलड़ा से विभिन्न प्रजातियों के पेड़-पौधों का महत्व जाना। राष्ट्रीय कुमाउनी पुस्तकालय का भ्रमण कर कुमाउनी साहित्य की भी जानकारी ली।

वाटिका के भ्रमण पर आए छात्र-छात्राओं ने तेजपत्ता, अश्वगंधा, नीम, तुलसी, गिलोय, आंवला, एलोवीरा आदि औषधीय पौधों की विशेषता जानी। वृक्ष पुरुष मलड़ा ने उन्हें चौड़ी पत्तीदार और चारा पत्ती वाले पौधों का महत्व बताया। युवाओं ने पौधों की प्रजाति और उनके गुणों को नोट भी किया। उन्हें औषधीय और बहुउपयोगी पौधे भी भेंट किए। इस मौके पर डॉ. शालिनी पांडेय, डॉ. उमा पांडेय, देवकी देवी, प्रशांत मलड़ा, मनीषा देवी, रविंद्र नगरकोटी आदि मौजूद रहे।

बागेश्वर में वृक्ष पुरुष से पौधों की जानकारी लेते कांडा के विद्यार्थी। विशेष

4. Ten days training programme

Under CM Innovation Scheme the herbal garden was established in GDC Kanda. During the development of herbal garden at GDC Kanda, ten days training-cum-demonstration programme on Herbal Garden was organized from 27/02/2022 to 08/03/2022 to educate and train the students and farmers about the importance of various medicinal and economic important plants. The detail of the training programme program as under:

Programme Schedule (Training Programme on Herbal Garden)

Date	Day	Resource Person	Address
27.02.2022	Day-1	1) Dr. Kamal Kumar Pandey 2) Mr. Harish Joshi	1) Scientist In-Charge, KVK, Kafaligair Bageshwar 2) Plant protection Scientist, KVK, Kafaligair Bageshwar
28.02.2022	Day-2	Dr. Vijay Arya	Assistant Professor, Botany, GDC Kanda, Bageshwar
01 .03.2022	Day-3	Mr. Praveen	Assistant Professor, Zoology, GDC Kanda, Bageshwar
02.03.2022	Day-4	Dr. Kevalanand Pandey	Assistant Professor Geography, GDC Kanda, Bageshwar
03.03. 2022	Day-5	1) Dr. Kamal Kumar Pandey 2) Mr. Harish Joshi	1) Scientist In-Charge, KVK, Kafaligair Bageshwar 2) Plant protection scientist, KVK, Kafaligair Bageshwar
04.03.2022	Day-6	1) Mr. Devendra Singh Jayestha 2) Mr. Sankar Rawat,	1) District Bhesaz coordinator, Bageshwar 2) Master Trainer, HRDI, Gopeshwar
05.03.2022	Day-7	Dr. Lalit Mohan Joshi	Lab Assistant Geology, GDC, Kanda, Bageshwar
06 .03.2022	Day-8	1) Mr. Devendra Singh Jayestha 2) Mr. Sankar Rawat,	1) District Bhesaz coordinator, Bageshwar 2) Master Trainer, HRDI, Gopeshwar
06.03 .2022	Day-9	Mr. Kailash Tamta	Assistant Professor, Chemistry, GDC, Kanda, Bageshwar
07.03. 2022	Day-10	Dr. Vinod Sah	Assistant Professor, Anthropology, GDC, Kanda, Bageshwar

Some glimpses of organized training program at GDC Kanda

5. **Procurement of planting material**: As per climatic condition of Kanda, various medicinal and aromatic plants viz. Ashwaganda, Artemisia, Lemongrass, Wild Garlic, Peppermint, Rose, Aloe Vera, Mint, Lavender, Oregano, Rosemary, Marjoram, Stevia, Tejpat, Geranium, Peppermint, Chamomile, Lemon Balm etc. were collected /procured form forest nursery and R&D institutions.

6. **Transplantation of Medicinal plants in the garden:** Various Medicinal plants medicinal and aromatic plants viz. Ashwaganda, Artemisia, Lemongrass, Wild Garlic, Peppermint, Rose, Aloe Vera, Mint, Lavender, Oregano, Rosemary, Marjoram, Stevia, Tejpat, Geranium, Peppermint, Chamomile, Lemon Balm etc. were planted in field beds and irrigation done after transplanting of medicinal plants.

Table: Medicinal plants grown in herbal garden and their uses

S. No.	Plant Name	Botanical Name	Family	Uses
1	Wild garlic	*Allium ursinum*	Amaryllidaceae	Cardiovascular, digestive problem
2	Aloe Vera	*Aloe barbadensis*	Asphodelaceae Liliaceae	Skin& hair care, constipation
3	Brahmi	*Bacopa monnieri*	Plantaginaceae.	Alzheimer disease, reduce anxiety
4	Lemongrass	*Cymbopogon flexuosus*	Poaceae /Gramineae	Fragrance, culinary industries
5	Lavender	*Lavandula angustifolia*	Lamiaceae/Mint	Aroma therapy, aromatic industries
6	Chamomile	*Matricaria chamomilla*	Asteraceae	Culinary, cosmetic & pharmaceutical industries
7	Lemon balm	*Melissa officinalis*	Lamiaceae	Prevent anxiety & stress, improve appetite
8	Peppermint	*Mentha piperita*	Lamiaceae	Aromatic & bakery industries
9	Menthol mint	*Mentha arvensis*	Lamiaceae	Aromatic & pharmaceutical
10	Marjoram	*Origanum majorana*	Lamiaceae	Cold& cough, muscular pain
11	Oregano	*Origanum vulgare*	Lamiaceae	Aromatic, culinary & seasoning industries
12	Geranium	*Pelargonium graveolens*	Geraniaceae	aromatic industries, hair care
13	Isabgol	*Plantago ovata*	Plantaginaceae	Reduce cholesterol, constipation
14	Damask Rose	*Rosa damascena*	Rosaceae	Skin care, aromatic industries
15	Rosemary	*Rosemarinus officinalis*	Lamiaceae	Aroma therapy, aromatic & bakery industries
16	Stevia	*Stevia rebaudiana*	Asteraceae	Anti-diabetes, pharmaceutical
17	Pyrethrum	*Chrysanthemum cinerariifolium*	Asteraceae	Natural insecticide
18	Ashwagandha	*Withania somnifera*	Solanaceae	Reduce stress & inflammation

7. Display Board of plants & funding agency Board: Display boards were installed in herbal garden premise mentioning common name, botanical name & uses. Also, Funding agency board was also installed in herbal garden for acknowledgement**.**

8. Inter-cultural Activities: Weeding, hoeing, pruning etc. were done as and when required.

9. Budget utilization:

S.No.	Activities	Expenditure (In Rs)
1.	Land development/ Structure development	1,55,400.00
2.	Field Visits (CIMAP Research Centre, Purara and Him Organic, Charso, Garur and Devki Vatika Bageshwar)	22,000.00
3.	Medicinal plant expert sitting fee (two visit)	22,032
4.	Soil testing equipments	4932.00
5.	Purchasing of Organic Manure/ fertilizers/ Pesticides	3550.00
6.	Procurement of plant saplings	2000.00
7.	Display board preparation & installation and Board of Funding Agency	29,615.00
8.	Agricultural and Irrigation equipments and dustbins	12,750.00
10.	Stationary	10,081.00
11.	Labor cost	15,000.00
12.	Water supply fitting and equipment	19450.00
13.	Paint items	3190.00
Total		**3,00,000**

10. Outcomes:

- Herbal garden will help to conserve the bio-resource (medicinal and aromatic plants).
- Herbal garden will create awareness on the significance of traditional uses of medicinal plants for better health and life to students, parents/guardian and teachers.
- Herbal gardens provide an opportunity to inculcate a sense of familiarity and respect about surrounding biodiversity.
- Herbal garden will spread knowledge among the, students and others on the medicinal plants commonly used in the Indian System of Medicine.
- The economically important medicinal plants grown and maintained in herbal garden will educate the local farmers to adopt these plants in their agriculture for crop diversification and to maximize their agriculture returns.
- In future various endemic plants and rare endangered plant viz. beriberis, chiraita, texus etc. will be introduced for their in situ conservation.