

Cultivation and Marketing Challenges in Growth of Herbal Plants in Garhwal Region, Uttarakhand

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Abstract

Evidence based on observation and conversation with the farmers played a major role in findings of this study. The study's main goal is to assess the current state of the market for medicinal plants in hilly region of Uttarakhand with a focus on easily accessible transportation, as well as storage facilities, threats and tactics associated with marketing these products in the region under proper supervision.

Keywords: Challenges, Strategies, Marketing, Medicinal Plants.

Introduction:

The Indian Himalayan Region harbor about half of the flowering plant species recorded in India, of which nearly 30% species are endemic. The state of Uttarakhand, also known as the 'herbal state of India,' harbors more than 5000 species of vascular plants, of which one-third species have medicinal uses. Angiosperms alone accounts to 15% of the studies followed by pteridophytes and gymnosperms (10% each), whereas, the lower plants are distinctly understudied with lichens (8%) and bryophytes (6%). Interestingly, the alpine, sub-alpine and temperate regions are explored in terms of floristic studies as compared to lower elevations such as Upper Gangetic Plains and adjacent Siwalik and Sub-Himalayan tracts in the state ⁽¹⁾. Notably, medicinal plants are an important source of livelihood for many rural communities in Uttarakhand that contribute 17-35% of the household income ⁽²⁾.

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The present study aims to highlights the challenges faced by farmers during cultivation and marketing of these herbs and flowering plants as Uttarakhand lacks proper transportation facilities in hilly areas and climate in hills is extreme cold or hot and calamities like flood or earthquake are common here.

Scope of growing herbal and aromatic plants:

- Diverse flora of Uttarakhand is very useful of growing herbal and aromatic plants.
- Collection, processing and selling of medicinal plants contribute to cash income for poor people.
- Medicinal plant enterprises are gaining much popularity nowadays like Patanjali in Haridwar, its products are used in both national and international markets.

Table.1: Some of the major herbal plants found in Uttarakhand: their botanical name, common name, habitat and uses

Botanical Name Local Name (Family)	Parts use in Ayurvedic	Habitat	Uses
Abies pindrow Royle Raga(Pinaceae)	Bark	Tree	As a tonic for bronchitis, hemoptysis, asthma, inflammatory conditions, fever and hypoglycemia
Abutilon indicum(l) Atibala(Malvaceae)	Fruits, Leaves	Shrubs	facial paralysis and joint disorders
Achillea millefolium L Momoduru (Asteraceae)	Flower	Herb	To stop bleeding of wounds and cuts; as a poultice for burns and open sores; used to cure fevers and colds; and alleviates toothaches
Abrus precatorius L Ratti(Fabaceae)	Seed and roots	Climber	used in vata disorders like joint pains and paralysis. The paste of seeds is applied locally in alopecia and skin diseases
Acorus calamus L Vacha(Araceae)	Rhizomes	Herb	useful in Slurred speech, Headache, Edema, Skin diseases, Eye diseases, Colic, Piles, Indigestion, Acid gastritis, heart disease and Ear diseases
Aconitum heterophyllum wall.ex. Royle Atis(Ranunculaceae)	Roots	Herb	Expectorant, febrifuge, anthelmintic, anti-diarrhoeal, anti-emetic, and anti-inflammatory They are also used against poisoning due to scorpion or snake bite and to cure fever and contagious diseases.
Acacia catechu (L.F) Willd Kher (Mimosaceae)	Wood and bark	Tree	The extract of this plant is used to treat sore throats and diarrhea, also useful in high blood pressure, dysentery, colitis, gastric problems, bronchial asthma, cough, leucorrhea and leprosy. It is used as mouthwash for mouth, gum, sore throat, gingivitis, dental and oral infections.

Acacia nilotica(L) Delile Babool (Mimosaceae)	Bark	Tree	Treatment of various diseases and disorders like in skin, sexual disorders, stomach and tooth problems etc in human beings as well as in animals.
Adhatoda zeylanica Medic Vasaka (Acanthaceae)	Leaves	Shrub	Bronchitis, leprosy, blood disorders, heart troubles, thirst, asthma, fever, vomiting, loss of memory, leukoderma, jaundice, tumors, mouth troubles, sore-eye, fever, and gonorrhea
Acacia catechu Khair	Bark	Tree	To treat sore throats and diarrhea, also useful in high blood pressure, dysentery, colitis, gastric problems, bronchial asthma, cough, leucorrhea and leprosy, to treat cancer, bronchitis, asthma, chest wound healing discomfort, sore throats, diarrhea, ulceration, vitiligo, and eczema
Achyranthes aspera Latjeera	Seed	Herb	Treating stones in the bladder, piles, stomach troubles, wound, and cancer
Aconitum heterophyllum Atis	Roots	biennial herb	Expectorant, febrifuge, anthelmintic, anti-diarrhea, anti-emetic, and anti-inflammatory. They are also used against poisoning due to scorpion or snake bite and to cure fever and contagious diseases
Acorus calamus Bach	leaves and rhizomes	Herb	Epilepsy, mental ailments, chronic diarrhoea, dysentery, fever, abdominal tumours, kidney and liver troubles, and rheumatism
Aegle marmelos Bel	Fruits, Leaves, bark and roots	Plant	The leaves are most effective in treating fever, nausea, vomiting, swellings, dysentery, dyspepsia, seminal weakness, and intermittent fever. The roots of Bel are thought to be effective in treating urinary problems, preventing heart palpitations, and curing fevers.
Agave Americana Ram-bansh	Leaves	Herb	Antiseptic, diaphoretic, diuretic and laxative. The juice and sap of the Agave plant can be used to treat intestinal gas, constipation, upset a stomach, weak digestion, malicious gut bacteria, stomach inflammation, and ulcer.

Aesculus indica Pangar	Fruits, Seeds, bark and roots	Tree	Joint pain, bladder and gastrointestinal problems, fever, leg cramps, and other conditions
Ajuga bracteosa Ratpatti, Ratpatia	Leaves, roots	Herb	The whole plant has been traditionally used as medicine. People use Ajuga bracteosa is used for cough.
Albizia lebeck Siris	Bark and leaves	Tree	Migraine, conjunctivitis, diarrhea, jaundice, skin problems, asthma coughs, boils, lung problems, flu, and gingivitis ophthalmia and other eye problems.
Allium cepa Pyaj or Pyaz	Bulb	perennial herb	Cough due to bronchitis, asthma, inflammatory disorders, dysentery, ulcer wounds, scars, keloids, pain and swelling after bee or wasp stings.
Allium sativum Lehsan	Bulb	perennial herb	Antilipemic (cholesterol-lowering), antihypertensive, antimicrobial, and anticancer qualities, all of which help prevent cancer cells from forming in the stomach, liver, and other human organs and help with asthma, arthritis, back pain, bronchitis, chronic fever, tuberculosis, rhinitis
Angelica glauca Gandhrayan	biennial or perennial herbs Roots/Rhizome	biennial or perennial herbs	Treat vomiting in children, stomach troubles, and for cardiovascular health for respiratory illnesses, joint pains, and menstrual irregularity.
Artemisia indica Patti	leaves, flowering tops	Herbs, perennial, or subshrubs	Fevers, inflammation, headaches, bleeding, and malaria treatment of diseases such as malaria, hepatitis, cancer, inflammation, and infections by fungi, bacteria, and viruses.
Artemisia nilagirica Ghari Patti	shrub Hole plant	shrub	The leaf decoction is a remedy for burning sensation in conjunctivitis and the decoction of root is used as an anti-septic. The whole plant is used in cough, asthma, bronchitis, skin diseases, fever and intestinal worms
Asparagus racemosus Satavari, Kairua	Roots	Herb/climber	improve the volume and frequency of urination. treat diarrhea and enhancing digestion. prevent ageing, increase longevity, impart immunity, improve mental

			function, vigor and add vitality to the body and it is also used in nervous disorders, dyspepsia, tumors, inflammation, neuropathy, hepatopathy
Azadirachta indica Neem	fruit, seeds, leaves, stems, and bark	Tree	Treatment of fever, headache, ulcers, respiratory disorders, cancer, diabetes, leprosy, malaria, dengue fever, chickenpox, and skin complications. Boosts immunity. Promotes brain health, manages diabetes, promotes liver health, Prevents and treats infections, promotes oral health, Purifies blood. Treats wounds and ulcers.
Bacopa monnieri Mandook parni, Pan bhrahi	Leaves and stem	Herb	Memory improvement, insomnia, epilepsy, and as an anxiolytic, memory acquisition, and anxiety reduction
Bauhinia vahlii Malu, Maljhan	Leaves, seeds	shrub	The seeds are tonic and aphrodisiac and the leaves are demulcent and mucilaginous. The seeds can be eaten raw or fried and cooked as a pulse.
Bauhinia variegata Kachnar	roots, leaves, stems, seeds, flowers, flower buds and barks	Tree	Treatment of gastrointestinal disorders, skin diseases, respiratory problems, diabetes, inflammation, and cancer., dropsy, pain, rheumatism, convulsions, delirium, and septicemia.
Berberis aristate Kilmora, Rasut	Root, bark, leaf and fruit	shrub	Aristata extracts and its formulations are also useful in the treatment of diarrhea, hemorrhoids, gynecological disorders, HIV-AIDS, osteoporosis, diabetes, eye and ear infections, wound healing, jaundice, skin diseases and malarial fever. used as mild laxative for children, the roots and bark as astringent, stomatic, diaphoretic, and to remedy piles.
Bergenia ciliate Prashanbheda	Leaves, Rhizome, Root and Flowers	perennial herb	Curing pulmonary infections, leucorrhea, piles and for dissolving bladder and kidney stones, as tonic, astringent, antiscorbutic, laxative, spleen enlargement, dysuria and ulcers, Diabetes, Diuretic, Demulcent and

			Astringent, Paralysis, Kidney Stones, Piles, Cure Fever, Swollen Joints.
Bergenia ligulate Pathar chatta	Roots and leaves	herb	Dissolving kidney stone, ant diabetic, antipyretic, hepatoprotective, anticancer, antiprotozoal, diuretic, cardiovascular, ant scorbutic, antilithiatic, anti-inflammatory, urinary bladder stone, diuretic activity, anti-bradykinin activity, antiviral activity, antipyretic activity, antibacterial, hepatoprotective activity, insecticidal activity, α -glycosidase activity.
Betula utilis Bhojpatra	Bark	Tree	Skin disinfectant, diseases of the blood and the ear, convulsions, wound healing, bronchitis, leprosy, styptic (to stop bleeding) and to stop any purulent discharge
Boerhavia diffusa Punernava	Leaves, seeds and roots	Herb	Inflammation, jaundice, asthma, rheumatism, get relief from cataract, nephrological disorders, ascites, anemia, and gynecological disorders, purify blood, Seeds are tonic expectorant, carminative, useful in lumbago, scabies, The seeds are considered as promising blood purifier, Seeds are used as energizer and for help in digestion, The roots are reputed to be diuretic and laxative and are given for the treatment of anasarca, ascites and jaundice, The root juice is used to cure asthma, urinary disorders, leucorrhoea, rheumatism, and encephalitis , roots have been widely used for the treatment of dyspepsia, jaundice, enlargement of spleen, and abdominal pain, and as an anti-stress agent, to treat liver disorders, leaf juice is used in the eyes for topical application, leaves vegetable is consumed to reduce edema, Leaf juice with honey, dropped into the eyes for chronic ophthalmia , The leaves are useful in dyspepsia, tumors, spleen enlargement; abdominal pains.

Bombax ceiba Semal	Bark and flower	Tree	Decoction of the bark is given orally to combat fever; diabetics should take decoction of the heartwood; bark juice is given to reduce stomachache. Product 'Acne-n-Pimple Cream' is prepared from Bombax along with other plants to treat pimples and skin eruptions. beneficial in the treatment of male sexual disorders, extracts are also helpful in the treatment of gastrointestinal disorders like dysentery and diarrhea
Brassica rapa subsp. Sarson	Leaves and seeds	perennial herb	treatment of headaches, chest complaints, rheumatism, oedemas, gonorrhoea, syphilis, and rabies, lower blood pressure and reduce cardiovascular risk
Calotropis procera Ak		Shrub	diarrhea, stomatic, sinus fistula, and skin disease, leaf part is used to treat jaundice, help thin mucous and make it easier to cough up, treating skin, digestive, respiratory, circulatory and neurological disorders and was used to treat fevers, elephantiasis, nausea, vomiting, and diarrhea. The milky juice of Calotropis procera was used against arthritis, cancer, and as an antidote for snake bite.
Cassia fistula Amaltas	Bark, roots and leaves	Tree	Skin diseases, liver troubles, tuberculous glands and its use in the treatment of haematemesis, pruritus, leucoderma and diabetes, diabetes, pink eye, joint and muscle pain (rheumatism), constipation. root is employed in treating of flus and colds whereas the leaves are employed in relieving pain, edema, and reducing skin irritation as result of swelling
Crocus sativus Kesar	Flower (stigmas)	perennial herb	amenorrhoea, coughs, asthma, as well as cardiovascular and stomach disorders, rheumatoid arthritis (RA), gout, and an inherited fever disorder called familial Mediterranean fever.

Dactylorhiza hatagirea Salam Panja	Leaves roots and tubers	herb	dysentery, diarrhoea, chronic fever, cough, wounds, burns, fractures, stomach-ache, the juice extracted from tuber is used as a tonic and used for the treatment of pyorrhea (inflammation of the gum and teeth). Root paste is externally applied as a poultice on cuts and wounds and extract is given in intestinal disorders,
Datura stramonium Dhatura	Leaves, roots, fruit and seed	herb	treatment of stomach and intestinal pain that results from worm infestation, toothache, and fever from inflammation. The juice of its fruit is applied to the scalp, to treat dandruff and falling hair. Its leaves, applied after roasting, are useful in relieving pain. The bitter narcotic plant relieves pain and encourages the healing process. The seeds of the plant are medicinally the most active. Externally, the plant is used as a poultice in treating fistulas, abscesses wounds and severe neuralgia.
Dioscorea bulbifera Gethi	Stem, Tuber, Leaves	Climber	Treatment of Piles, dysentery, syphilis, ulcers, cough, leprosy, diabetes, asthma, cancer, cough, cold, stomach ache, leprosy, burns, fungal infections, dysentery, skin diseases, rheumatism, arthritis, in several formulations, and even for birth control
Eclipta prostrata Bhangru, Bhangri	Leaves	herb	Treat asthma and other respiratory illnesses, The mixture of leaf juice and honey is used to cure catarrh in infants, promote hair growth
Evolvulus alsinoides Sankha-pushpi	Leaves, stem and roots	herb	The whole plant is used in form of decoction in nervous debility and loss of memory. The plant is also useful as blood purifier and in bleeding piles. The fresh flowers with sugar are eaten as a brain tonic. The leaves are made into cigarettes and smoked in chronic bronchitis and asthma, used as an anthelmintic, and to treat scorpion

			stings, cuts, fever, wounds and burns. to treat cough, cold and fever.
Ficus palmata Bedu	Fruit	Tree	Gastrointestinal disorders, hypoglycemia, tumor, ulcer, diabetes, hyperlipidemia and fungal infections, diabetes, liver disorders, diarrhea, inflammatory conditions, hemorrhoids, respiratory, and urinary.
Ficus religiosa Pipal	leaves, bark, seeds and fruits	Tree	used in traditional medicine for about fifty types of disorders including asthma, diabetes, diarrhea, epilepsy, gastric problems, inflammatory disorders, infectious and sexual disorders.
Glycyrrhiza glabra Mulethi	Rhizomes and roots	perennial herb	Glycyrrhiza glabra L. (Licorice) is a small perennial herb that has been traditionally used to treat many diseases, such as respiratory disorders, hyperdipsia, epilepsy, fever, sexual debility, paralysis, stomach ulcers, rheumatism, skin diseases, hemorrhagic diseases, and jaundice.
Grewia optiva Bheemal	leaves, stem, and root as well as the fruit	Tree	The leaves, stem, and root as well as the fruit of Grewia species are used as to treat anaemia, cough, diabetes, diarrhoea, dysentery, dyspepsia, eczema, fevers (malaria), heatstroke, hepatitis, itches, typhoid, smallpox, syphilitic ulcers, and wound healing.
Juglans regia Akhrot	Nut, bark, and leaves, as well as the husks of the seeds	Tree	The medicinal plant Juglans regia has been used extensively in traditional medicine for a variety of illnesses, including helminthiasis, diarrhea, sinusitis, stomach aches, arthritis, asthma, eczema, scrofula, skin disorders, and various endocrine diseases such as diabetes mellitus, anorexia, thyroid dysfunctions. helps to improve your skin.
Mangifera indica Aam	Roots, bark, stem leaves, fruits, seeds, flowers and kernels	Tree	seeds are used in asthma and as an astringent. Fumes from the burning leaves are inhaled for relief from hiccups and affections of the throat. The

			bark used against rheumatism and diphtheria. The resinous gum from the trunk was applied to cracks in the skin of the feet and on scabies. Mango kernel decoction and powder were used as vermifuges and as astringents in treatment for diarrhea, hemorrhages and bleeding hemorrhoids.
Mentha arvensis Pudina	leaves and stems	perennial herb	The leaves of Mentha arvensis are recorded to possess potent therapeutic values. Leaves of plant also possess aromatic fragrance and are utilized as a flavoring agent. The leaves are utilized for the treatment of liver disease, spleen, asthma and jaundice. used in patients with hypertension and ischemic heart disease. The plant species are well recognized for their folk medicinal uses, especially to treat cold, fever, digestive and cardiovascular disorders. The leaves of Mentha arvensis are recorded to possess potent therapeutic values.
Ocimum sanctum Tulsi	leaves, stem, flower, root, seeds and even whole plant	herb	Used specially for treating various types of diseases and lowering blood glucose also treats cold, fever, parasitic infestations on the body and inflammation of joints and headaches.
Oxalis acetosella Chalmori	Leaves, stem roots	perennial herb	Treatment of gastric disorders, the fresh or dried leaves are anodyne, antiscorbutic, astringent, diuretic, emmenagogue, expectorant, febrifuge, irritant and stomachic, A decoction is used in the treatment of fevers, both to quench the thirst and allay the fever, treatment of neurological disorders like epilepsy, depression, dementia and neurodegenerative maladies.
Phyllanthus emblica Amla	fruits, leaves, stem, and roots	Tree	Treat diabetes, diarrhea, fever, gonorrhea, alopecia, headache, dyspepsia, inflammation, oral ulcer, vomiting, pruritus, scurvy, pain, and wound, Improves Immunity. Amla benefits include antibacterial &

			<p>astringent properties which help improve the body's immunity system, Hair Care, Reduces Stress, Eye Care, respiratory Health, Treats Anemia, Blood Purifier, Diuretic.</p>
<p>Potentilla fulgens Bajradanti</p>	<p>Roots and leaves</p>	<p>shrub</p>	<p>Fulgens root-stock and whole herb is utilized as astringent and tonic for curing gum and tooth ailments (pyorrhea, toothache and caries), diarrhoea, stomach problems, cough, cold, diabetes mellitus and cancer, sore throat, menstrual cramps (dysmenorrhea), premenstrual syndrome. fulgens root-stock and whole herb is utilized as astringent and tonic for curing gum and tooth ailments. (pyorrhea, toothache and caries), diarrhea.</p>
<p>Solanum nigrum Makoi</p>	<p>Roots and leaves</p>	<p>herb</p>	<p>The juice of the plant is used on ulcers and other skin diseases. The fruits are used as a tonic, laxative, appetite stimulant, and for treating asthma. The juice from its roots is used against asthma and whooping cough, treating fever, opium poisoning, splenomegaly, diseases of the liver, rodent bites, vitiligo and nausea.</p>
<p>Swertia nervosa Chirayata</p>	<p>Whole plant</p>	<p>herb</p>	<p>Treat fever, typhoid, malaria, eye disease, jaundice, as well as appetizer, taste enhancer, tonic, cooling and digestive agents, liver disorders, malaria, and diabetes.</p>
<p>Taxus baccata Thuner</p>	<p>Bark and leaves</p>	<p>Shrub or tree</p>	<p>Common cold, cough, fever, and pain.</p>
<p>Terminalia bellirica Bahera</p>	<p>All parts of the tree</p>	<p>Tree</p>	<p>Effective in the treatment of eye diseases, asthma, hepatitis, and dyspepsia, while the fruit pulp is useful in piles, leprosy, and diarrhea. The fruit's decoction is useful as a cough remedy,</p>
<p>Tinospora cordifolia Giloy</p>	<p>root, stems, and leaves</p>	<p>Climbing shrub</p>	<p>Treatment of fever, jaundice, chronic diarrhea, cancer, dysentery, bone fracture, pain, asthma, skin disease,</p>

			poisonous insect, snake bite, eye disorders.
Urtica dioica Bicchughas	stems, leaves and roots	herb	Treat painful muscles and joints, eczema, arthritis, gout, and anemia, used in the control of cardiovascular disorders especially hypertension.
Viola betonicifolia Banafsha	leaves and flowers	herb	Tea with dried root is a laxative. Tea with whole plant treat digestive disorders. Poultices reduce swelling, skin infection, inflammation, hemorrhoids, skin cancer and growths. The scent of violet flowers is distinctive with only a few other flowers having a remotely similar odour.
Withania somnifera Ashwagandha	Root	herb	Reduce swelling, lower blood pressure, and alter the immune system, treating wide variety of asthma, diabetes, hypertension, stress, arthritic diseases, and cancer.
Zanthoxylum armatum Timur	Fruits, seeds, and bark	shrub	used in curing various common ailments such as toothache, common cold, cough, and fever. The species has several ethnobotanical uses such as the treatment of toothache, fever, indigestion, cholera, headache, abdominal pain, rheumatism, skin diseases, diabetes and asthma.
Ziziphus mauritiana Ber	Bark Fruit Leaf Seed and stem bark	Tree	It is used to treat various diseases such as heartburn biliousness, biliousness, astringency, scabies, diuretic and nausea.

Challenges in cultivation of herbal plants: The most common issues with which the producers of medicinal plants encountered are:

1. **Market:** Some challenges for marketing herbal plants in Uttarakhand include:

- **Poor Marketing infrastructure:** the marketing of medicinal plant is opaque, with many intermediaries and limited information on prices and limited knowledge about marketing skills.
- **Illegal trade:** many medicinal plants are traded illegally like illegal extraction of Kutki.
- **Preference for wild plant:** many manufacturers prefer wild medicinal plant over cultivated plant as they believe wild plant is more efficient and contain better chemical content.
- **Sustainability:** the growing trade in medicinal and aromatic plants in Uttarakhand is incompatible with sustainability goals due to unregulated exploitation of resources.

2. Low earning: Some farmers struggle to earn from herbal farming because they are forced to sell their product to government at lower price.

3. Post-harvest processing: After harvesting plants need processing immediately to retain their chemical value, but in hills transportation facility is not good and we don't have storage units due to which plant decompose or get dried.

4. Safety, effectiveness and quality: Scientific evidence from tests done to evaluate the safety and effectiveness of traditional medicine products and practices is limited. The safety, effectiveness and quality of finished herbal medicine products depend on the quality of their source materials (which can include hundreds of natural constituents), and how elements are handled through production processes.

5. Medicinal Knowledge of Herbal plants: Medicinal products that are collected from wild plant populations need more knowledge about the dosage form, its cultivation method, its side effect and usage. More scientific study needs to be done to preserve both plant populations and knowledge on how to use them for medicinal purposes is needed to sustain traditional medicine.

6. safety and use: Many people believe that herbal medicines or traditional medicines are not safe as they do not have much scientific study. they are safe. There is a lack of patient awareness about safe usage of herbal medicine.

7. Environmental conditions: Since Uttarakhand is a hilly state so environmental conditions are either too hot in summers or extreme cold in winters. Calamities like earth quake and cloud burst are hinderance in cultivation, harvesting and post processing of herbs and medicinal plants.

Conclusion:

Many of the farmers are not aware of the demands of herbal and medicinal plants in current scenario and support schemes provided to them by the government. Serious gaps were seen in availing government support schemes in medicinal plant cultivation by farmers, leading to limited success and productivity. There is a need to create awareness among the farmers regarding the benefits of medicinal plant cultivation and related training programmes to increase production and productivity of medicinal plants substantially. Support from the government will encourage medicinal plant cultivation. Government should provide better facilities like transportation, storage facilities, proper training and more scientific study of herbal and aromatic plants.

References:

1. Himanshu Bargali¹, Amit Kumar², Pradeep Singh³. Plant studies in Uttarakhand, Western Himalaya—A comprehensive review. Elsevier. Trees, Forests and People Volume 8, June 2022.
2. R.S. Chauhan Socio-economic improvement through medicinal and aromatic plants (MAPs) cultivation in Uttarakhand, India J. Sustain. Agric., 34 (6) (2010), pp. 647-658.
3. Mazumder TZ, Sharma MK, Lal M. Phytochemical properties of some important medicinal plants of north-east India: a brief review. J Pharm Innov 2022; 11:167-75.
4. Halberstein RA. Medicinal plants: historical and cross-cultural usage patterns. Ann Epidemiol 2005; 15:686-99.
5. Dibya Sundar Panda, Ranjan Kumar Giri. Medicinal Plant Cultivation: Current Scenario, Challenges, and Opportunities from Indian Farmer's Perspective. Journal of Health Science and Medicinal Research. ISSN 2630-0559.
6. Qazi MA, Molvi K. Herbal medicine: a comprehensive review. J Pharm Res 2016; 8(2):1-5.

7. Kala CP. Assessment of species rarity. *Curr Sci.* 2004; 86:1058–1059.
8. Ramana Rao¹, Dr. Gulab Singh². Challenges and Strategies of Marketing of Medicinal Plants. *International Journal of Horticulture, Agriculture and Food Science.* 2023; Vol-7, Issue-5.
9. Nautiyal, Sunil & Smitha, K. & Kaechele, Harald. (2020). Medicinal Plant Biodiversity in India: Harnessing Opportunities for Promoting Livelihood and Food Security. 10.1007/978-3-030-32463-6_7.
10. Khasim, Shaik & Long, Chunlin & Thammasiri, Kanchit & Lutken, Henrik. (2020). Medicinal Plants: Biodiversity, Sustainable Utilization and Conservation. 10.1007/978-981-15-1636-8.