



Raising Farmers Income through the Cultivation of Medicinal and Aromatic Plants

Dinesh Sharma*, V. K. Chaudhary and Inder Dev

Directorate of Extension Education, Dr. Y.S. Parmar University of Horticulture & Forestry, Nauni, Solan, Himachal Pradesh (173 230), India

Corresponding Author

Dinesh Sharma

e-mail: dineshsharma7@gmail.com

Article History

Received on 02nd March, 2024

Received in revised form on 08th May, 2024

Accepted in final form on 17th May, 2024

Abstract

The present study was conducted during October, 2022 to April, 2023 in the Shimla district of Himachal Pradesh which is predominated by the cultivation of apple. Medicinal and aromatic plants are playing an important role in Homeopathy, Ayurveda and Unani medicines. Local inhabitants have been using these plants for various ethno pharmaceutical uses. Stratified Random Sampling was used for conducting the survey. Both Primary and Secondary information (data) were collected through schedules, questionnaires, face to face talks, personal interviews and group discussions. Societies and Self Help Groups (SHGs) were created for the cultivation of *Saussurea costus* (Kuth) and *Aconitum heterophyllum* (Patish). Local trader has purchased Kuth at the rate of ₹ 200 per Kilogram and *Aconitum heterophyllum* (Patish) at the rate of ₹ 2000 per Kilogram. In Delhi market, the farmers have received higher rates (₹ 300 per Kilogram for *Saussurea costus* (Kuth) and ₹ 2100 per Kilogram for the *Aconitum heterophyllum* (Patish)). On an average, a farmer was reported to earn ₹ 50,000 to ₹ 100,000 per bigha per annum from the cultivation of these medicinal plants.

Keywords: Medicinal and aromatic plants, cultivation, income and survey

1. Introduction

The global market for herbal products is continuously expanding and it is expected to touch the mark of US\$ 5 trillion by the year 2050, from the US\$ 62 billion in 2004 (Purohit and Vyas, 2004). In global market of production of plants products, India is on 6th place with about 7% of total world production (Singh, 2005). India has one of the richest sources of many kinds of medicinal and aromatic plants but it has achieved only a limited success in tapping the potentials of these plants because of low level of awareness among the farmers about the economic potential and returns from these plants (Purohit and Vyas, 2004; Singh et al, 2007; Singh, 2005; Singh, 2009).

Himachal Pradesh, located in the lap of Himalayas has varied climatic conditions due to variation in altitudes ranging from 450 meters to 6500 meters above mean sea level (Balokhra, 1995). Himachal Pradesh is known as apple state as it produces quality fruits and its economy is dependent on it. The area of survey is predominated by the cultivation of apple orchards. Plantation of apple is relatively new and the people are growing intercrops in their fields during the gestation period of apple with potato, peas, wheat, maize, barley and millets. Some of the rare millets like Koda, Cholai, Ogla, Chini, Kaoni

etc. are still grown in this area. Cow, Ox, Sheep and goats are reared by the people. Women have equal contribution in performing the farm duties and have a major role in decision making. Groups created for the cultivation of medicinal and aromatic plants are actively involved and perform their duties well (Figure 1). Traditionally people use many herbs for mother and child health care in this region (Sharma and Kumari, 2012).

Chanshal mountain range, a catchment of River Pabbar is an abode of rich biodiversity which include various medicinal and aromatic plants. Local inhabitants have been using these plants for various ethno pharmaceutical uses (Chauhan,



Figure 1: Community user groups constituted for cultivation of medicinal and aromatic

1999). Medicinal herbs of temperate to sub alpine zone are being extracted from this region every year. As this resource is becoming scarce and some species are at the verge of extinction due to over exploitation, there is a need of its conservation and sustainable use. Ministry of Ayush and Ministry of Forest and climate change has been putting considerable emphasis on the cultivation of Medicinal and Aromatic plants. Estimates show that potential return to farmers from cultivation of medicinal plants are quite high (Nautiyal, 1995). The cultivation of certain high altitude Himalayan herbs could fetch products price anywhere between ₹ 7150 to 55000 ha⁻¹ (Nautiyal, 1995). As no documented data is available for the income solely from medicinal and other useful plants of Shimla hills, a survey and documentation of this aspects of the area will be helpful to common men, students, industry and research workers.

2. Materials and Methods

Stratified Random Sampling (Cochran, 1977) was used for conducting the present survey on medicinal and aromatic plants during October, 2022 to March, 2023 in the different parts of Shimla districts of Himachal Pradesh. There are 11 Development Blocks in district- Shimla, out of which two blocks were randomly selected as strata namely Jubbal and Chohara and 11 villages were selected randomly as stratum

(Singh and Chaudhary, 2013). A detailed survey was conducted in the area where people have adopted the cultivation of medicinal plants in small scale. The surveyed area included villages of Gaichwari, Manjwari, Jatwani, Chichwari, Thana, Rohal, Janglikh, Dumera, Khabal, Jhagtan and Mangyali (Figure 2). In these villages, a few farmers has adopted the cultivation of medicinal and aromatic plants as they were encouraged to do so by the department of Ayush and Department of Forest, Government of Himachal Pradesh. Primary information and data were collected through schedules, questionnaires, face to face talks, personal interviews and group discussion (Barr, 1957). To examine the economics of medicinal and aromatic



Figure 2: Farmers growing the medicinal and aromatic plant seeds in their field

Table 1: Medicinal and aromatic plants of high economic value found in the forests of study areas

Sl. No.	Botanical name	Common name	Family	Official part	Used for the treatment of
1.	<i>Achillea millefolium</i>	Biranjaspaha Gandana	Asteraceae	Flowers, Leaves and Stems	Spasmodic gastrointestinal disorders, hepatobiliary, gynecological disorders, digestive problems, respiratory infections, skin & liver disease
2.	<i>Aconitum deinorrhizum</i>	Vatsnabh, Mohrabish	Ranunculaceae	Crude extract of dry leaves and roots	Neuralgia, paralysis and muscular rheumatism
3.	<i>Aconitum heterophyllum</i>	Atish, Patish	Ranunculaceae	Tubers and roots	Blood pressure, cough, malarial fevers
4.	<i>Aconitum violaceum</i>	Mitha Patish	Ranunculaceae	Tubers	Asthma, cough, neural disorders and cardiac diseases
5.	<i>Angelica glauca</i>	Chora	Apiaceae	Roots & Rhizomes	Dyspepsia, constipations, ulcer of palate, dysentery, menorrhagia & rinderpest
6.	<i>Allium govanianum</i>	Jangli Piaj	Alliaceae	Roots, Bulbs & Leaves	Diabetes & liver diseases as well as allergy and arthritis, cold & cough
7.	<i>Atropa acuminata</i>	Indian belladonna	Solanaceae	Roots and Leaves	Parkinson's diseases, joint pain, nerve pain and leg pain
8.	<i>Atropa belladonna</i>	Belladonna	Solanaceae	Roots and Leaves	Intestinal diseases- peptic ulcers, persistent diarrhea
9.	<i>Chrysanthemum cinerariifolium</i>	Pyrethrum	Asteraceae	Flowers	Chest pain, high blood pressure, fever, cold, headache and swelling and control the mosquitoes

Table 1: Continue...



Sl. No.	Botanical name	Common name	Family	Official Part	Used for the Treatment of
10.	<i>Dactylorrhiza hatagirea</i>	Salampanja	Orchidaceae	Leaves and Tubers	Respiratory problems, neurological, digestive, urinary problems
11.	<i>Dioscorea deltoidea</i>	Singlimingli	Dioscoreaceae	Tubers	Anemia, abdominal pain, diarrhea, gastrointestinal disorders and intestinal worms
12.	<i>Ferula jaeschkiana</i>	Janglihing	Apiaceae	Fruits and Roots	Asthma, whooping cough, flatulent colic, bronchitis
13.	<i>Gentiana kurroo</i>	Karu, Trayaman	Gentianaceae	Roots and Rhizomes	Stomach-ache and urinary infections, fever
14.	<i>Heracleum candicans</i>	Patrala	Apiaceae	Fruit, Leaf, Roots	Gastric problems, skin diseases
15.	<i>Inular acemosa</i>	Pushkarmul	Asteraceae	Roots	Heart diseases, respiratory diseases
16.	<i>Nardostachys grandiflora</i>	Jatamansi	Caprifoliaceae	Roots and Rhizomes	Epilepsy, hysteria, syncope convulsions and mental weakness
17.	<i>Paeonia emodi</i>	Udsalib, Himalyan Paeony	Paeoniaceae	Roots, Leaves, Stems Seeds and Flowers	Diarrhea, ulcer, weakness, cramps, piles
18.	<i>Picrorhiza kurroa</i>	Karu, Kutki	Plantaginaceae	Roots and Rhizomes	Fatty liver diseases, fever, allergy, asthma Jaundice
19.	<i>Podophyllum hexandrum</i>	Bankakhdi	Berberidaceae	Roots and Rhizomes	Cancer, constipation, fever, jaundice, liver disorders
20.	<i>Polygonatum cirrhifolium</i>	Meda	Liliaceae	Rhizomes	Pain in kidney, pain in hips, swelling, bone joints, cough
21.	<i>Polygonatum verticillatum</i>	Mahameda	Asparogaceae	Rhizomes	Cadiotonic, demulcent, energizer
22.	<i>Rauvolfia serpentina</i>	Sarapgandha	Apacynaceae	Roots	Diabetes, hypertension, flue, diarrhea, liver problems
23.	<i>Rheum australe</i>	Revandchini	Polygonaceae	Rhizome	Gastritis, stomach problems, blood purification, liver diseases and menstrual problems
24.	<i>Rheum moorcroftianum</i>	Tukshu	Polygonaceae	Rhizome	Cold, cough, constipation
25.	<i>Selinum vaginatum</i>	Bhutkesi	Apiaceae	Roots, Rhizome, Fruits	Like- Hysteria dysmenorrhea, Skin diseases, high blood pressure, sleep & mental disorders
26.	<i>Selinum tenuifolium</i>	Muramansi	Apiaceae	Whole Plant	Respiratory problems like- Cough, cold
27.	<i>Saussurea costus</i>	Kuth	Asteraceae	Oil and Roots	Asthma, chronic gastritis, stomach ulcers
28.	<i>Swertia chirayita</i>	Chirayaita	Gentianaceae	Roots	Malaria, diabetes and liver disorders
29.	<i>Valeriana jatamansi</i>	Nihani	Caprifoliaceae	Rhizomes and Roots	Insect repelling and antimicrobial activities, insomnia and mental disorders

plants, simple cost accounting method was followed. The financial feasibility was worked out by comparing costs and returns at different stages of economic life.

3. Results and Discussion

The area has moist temperate forest to alpine scrubs type

of vegetation. *Cedrus deodara*, *Pinus wallichiana*, *Picea smithiana* and *Abiespindrow* are the major conifers species found in this area along with broad leaved species of *Quercus floribanda*, *Quercus semecarpifolia* and *Acer* species. Among the important medicinal plants, Salampanja, Atish, Vatsnabh, Karu, Kutki, Chora, Jatamansi, Dhoop, bankakri, Pashanbhed,



Chirayita, Revandchini, Singli-mingli, Banaksha, Bhutkesi, Daruhaldi, Mamiri, Kapurkachri, Guchhi, Nirbishi, Kuth are the major species found in this region (Silori and Badola, 2000) (Figure 3).



Figure 3: Farmer transplanting the medicinal and aromatic plant in their field

Peoples are historically involved in the trade of medicinal plants from the area. Local people are engaged by the contractors in collection of medicinal plants and for their local transport and preliminary processing which include cleaning and grading 29 species of aromatic and medicinal plants having high economic value were found near by study area (Table 1).

3.1. Start of cultivation of medicinal plants

In Rohal Village of Chirgaon Tehsil of Shimla district of Himachal Pradesh, some people started the cultivation of medicinal and Aromatic plants during 2012. In 2017, they constituted a society naming “Tridev Aushadhi Utpadan Society Rohal Chirgaon Himachal Pradesh”. The Society was registered under the Society Act in the same year. Sixteen (16) Self Help Groups (SHG;s) were constituted in the year 2018 in eleven different villages of Chirgaon and Jubbal Tehsils of Rohru Sub Division of Shimla district. These 16 groups were constituted by the Society to implement the Ayush Department Sponsored Scheme for the cultivation of *Saussurea costus* (Kuth) and *Aconitum heterophyllum* (Patish) and *Picrorhiza kurroa* (Kutki). The department of Ayush encouraged the local farmers by providing subsidy to the amount of ₹ 7000–10000 bigha⁻¹. They have started growing the medicinal plants in a portion of land which they were considering unproductive for traditional agriculture/ horticulture crops (Table 2 indicated the common name, botanical name, numbers of farmers growing the medicinal and aromatic plants (Figure 4). It was found that three common species of medicinal and aromatic plants viz., Patish, Kuth and Kutki mainly grown in the study areas by the 107 farmers in approximately 370 bighas of land. However, 74 farmers grown the Kuth in 218 bighas of land and minimum 14

Table 2: Medicinal plant species grown by farmers under Ayush Department Sponsored Scheme

Common name	Botanical name	No. of farmers	Area (Bigha)
Patish	<i>Aconitum heterophyllum</i>	18	50
Kuth	<i>Saussurea costus</i>	74	218
Kutki	<i>Picrorhiza kurroa</i>	14	49
Total		107	317



Figure 4: Farmers adopted the cultivation of medicinal and aromatic plants

Table 3: Average yield of medicinal and aromatic plants

Sl. No.	Species	Yield bigha ⁻¹ (Quintal)
1.	<i>Aconitum heterophyllum</i> (Patish)	1–1.25
2.	<i>Saussurea costus</i> (Kuth)	4–5
3.	<i>Picrorhiza kurroa</i> (Kutki)	1
4.	<i>Angelica glauca</i> (Chora)	1.5–2.0

farmers grown kutki species of medicinal and aromatic plants in 49 bighas of land. 107 farmers adopted the cultivation of three species of medicinal and aromatic plants (*Aconitum heterophyllum*, *Saussurea costus* and *Picrorhiza kurroa*) in 317 bighas of land. It shows their interest in adopting the cultivation of medicinal and aromatic plants for enhancing their income and improving the living standard. Analysis of cost of cultivation of main species of medicinal and aromatic plants grown were compute and cost-benefit ratio was observed 1:3.

In the year 2019, State Forest Department of Himachal Pradesh has launched Van Samridhi Jan Samridhi Yojna Scheme (VSJSY). The Forest department Rohru Forest Division has created some Community User Group in some villages with the help of the Tridev Aushadhi Utpadan Society Rohal Chirgaon Himachal Pradesh Initially six Groups were

constituted in the year 2019 for the cultivation of kuth (*Saussurea costus*). Subsequently in the year 2020, four more new groups were constituted for the cultivation of *Saussurea costus* (Kuth). The Tridev Aushadhi Utpadan Society in the year 2021, also created four more groups under Van Samridhi Jan Samridhi Yojna Scheme (VSJSY) for the cultivation of *Aconitum heterophyllum* (Patish).

Other 8 Community User Groups were created, 4 each in the year 2020 and 2021 in Village Gaichwari (2), Manjwari (3) Jatwani (1) Thana (1) and one CUG in Chichwari village. In this scheme of Van Samridhi Jan Samridhi Yojna (VSJSY), the State Forest Department's Rohru Forest Division and Khashadhar Forest Range has provided Forest lands for the cultivation of medicinal plants. Each Community User Group (CUG) has been allotted 12 bigha of land to grow kuth (*Saussurea costus*) and *Aconitum heterophyllum* (Patish). The seed money of ₹ 10,000 has been transferred to the account of each Community User Group (CUG).

3.2. Cultivation, production and marketing

Three Species of medicinal plants namely *Aconitum heterophyllum* (Patish), *Saussurea costus* (Kuth) and *Picrorhiza kurroa* (Kutki) were planted in the month of April. The planting material was procured from different sources. *Aconitum heterophyllum* (Patish) and *Picrorhiza kurroa* (Kutki) rhizomes were brought from the Ayush Nursery Damra Tehsil Chirgaon and *Saussurea costus* (Kuth) planting material was brought from Lahaul. The area has started the production of *Aconitum heterophyllum* (Patish) and *Saussurea costus* (Kuth) but *Picrorhiza kurroa* (Kutki) will give its first harvest from next year. Now some farmers have started cultivation of the *Angelica glauca* (Chora) In this area, average yield of the medicinal plants is low as compared to the commercially growing area of the country as shown in Table 3. Patish give production after 2 years of the planting and similar is the case with Kuth, Kutki and for Chora. People have started selling their produce in the local market. Local Trader naming Ram Singh Negi buys their produce at their villages itself. Some of the farmers have sold their produce in Khali BauriMandi of Delhi. Local trader has purchased Kuth at the rate of ₹ 200 Kilogram⁻¹ and *Aconitum heterophyllum* (Patish) at the rate of ₹ 2000 Kilogram⁻¹. In Delhi market, the farmer have received higher rates as ₹ 300 Kilogram⁻¹ for *Saussurea costus* (Kuth) and ₹ 2100 Kilogram⁻¹ for the *Aconitum heterophyllum* (Patish). On an average, a farmer is earning ₹ 50,000 to ₹ 100,000 bigha⁻¹ annum⁻¹ from the cultivation of these medicinal plants.

3.3. Socio economic impact

People of the area are very enthusiastic with this venture of growing medicinal plants. This activity has provided them an opportunity to raise additional income and generation of employment for the local educated youth. The families who are practicing the cultivation of medicinal plants has responded by saying that they have realized additional income

and has provided them an lucrative option to raise their living standard. The Tridev Aushadhi Utpadan Society which started their activities in a small scale has risen to the stature of a reputed organization. This extra source of income has provided farmer more flexibility in diversifying their farming practices. Earlier they started with the cultivation of Kuth and Patish, now they have started growing Kutki and Chora too. People are now earning ₹ 80,000 to ₹ 1,50,000 family⁻¹. Growing medicinal plants on government's land has provided the farmer extra land and opportunity to raise their income considerably.

3. Conclusion

The studies on raising farmers income through cultivation of medicinal and aromatic plants showed that cultivation of *Aconitum heterophyllum*, *Saussurea costus* and *Picrorhiza kurroa* species are good alternative source of income to the farmers. Now, farmers are cultivating these medicinal and aromatic plants crops on waste land as well as an intercrop in the apple orchards to enhance their income and to improve their living standard. They are diversifying the species every year and fetching good amount of money. This venture of cultivating medicinal and aromatic plants has generated a considerable amount of revenue and employment to the rural youth. The steps taken to promote the cultivation of medicinal and aromatic plants and to raise the income of the farmers in two blocks of Pabbar valley of Shimla district in Himachal Pradesh have been documented.

4. References

- Balokhra, J.M., 1995. The Wonderland Himachal Pradesh. H.G. Publications, New Delhi. pp, 1652.
- Barr, A., 1957. Differences between experienced interviewers. Applied Statistics 6, 180–188.
- Chauhan, N.S., 1999. Medicinal and aromatic plants of Himachal Pradesh. Indus Publication Co; New Delhi, pp, 632.
- Cochran, W.G., 1977. Sampling techniques. John Wiley and Sons(3rd Edn.). New York. pp, 442.
- Nautiyal, M.C., 1995. Agro-techniques of some high altitude medicinal herbs. In. Dehra Dun, India: Bishen Singh Mahandra Pal Singh 53-64 ISBN 8121101220.
- Purohit, S.S., Vyas, S.P., 2004. Marketing of medicinal and aromatic plants in Rajasthan. National Consultative Workshop on Medicinal and Aromatic Plants, held at GBPUA&T, Pantnagar.
- Singh, H.P., 2005. Promotion of medicinal and aromatic plant sector in Uttarakhand. Need of hour. National Consultative Workshop on Medicinal and Aromatic Plants, held at GBPUA&T, Pantnagar.
- Singh, K.M., Singh, U., Singh, P., 2007. A study on role of ATMA, Patna in development of supply chain for medicinal plants in Patana district, Bihar (India).
- Singh, D., Chaudhary, F.S., 2013. Theory and analysis of sample



- survey designs. New Age International Publishers. Pp, 332.
- Sharma, D.K., Kumari, A., 2012. Non timber forest products used for mother and child healthcare in tribal and remote areas of Himachal Pradesh. *Indian Forester* 138(12), 1151–1159.
- Singh, K.M., 2009. Scope of medicinal and aromatic plants farming in Eastern India. <http://dx.doi.org/10.2139/ssrn.2213308>.
- Silori, C.S., Badola, R., 2000. Medicinal plant cultivation and sustainable development: A case study in the buffer zone of the Nanda Devi biosphere reserve, Western Himalya, India. *Mountain Research and Development* 20(3), 272–279.

