Journal of Pharmacognosy and Phytochemistry
Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; SP5: 396-398

Ruchi R Gangwar
Assistant Professor, Deptt. of Agril. Economics, College of Agriculture, G.B.P.U.A.T, Pantnagar, Uttarakhand, India

Shweta Chaudhary
Assistant Professor, Deptt. of Agril. Economics, College of Agriculture, G.B.P.U.A.T, Pantnagar, Uttarakhand, India

Chandra Dev
Associate Professor, Deptt. of Agril. Economics, College of Agriculture, G.B.P.U.A.T, Pantnagar, Uttarakhand, India

Kiran Raana
Assistant Professor, Deptt. of Agril. Communication, College of Agriculture, G.B.P.U.A.T, Pantnagar, Uttarakhand, India

Supriya
Assistant Professor, Deptt. of Agril. Economics, N.D University of Agril & Technology, Kumarganj, U.P, India

Correspondence
Ruchi R Gangwar
Assistant Professor, Deptt. of Agril. Economics, College of Agriculture, G.B.P.U.A.T, Pantnagar, Uttarakhand, India

(Special Issue- 5)
International Conference on
"Food Security through Agriculture & Allied Sciences"
(May 27-29, 2019)

Future prospects and constraints of medicinal and aromatic farming in Uttarakhand

Ruchi R Gangwar, Shweta Chaudhary, Chandra Dev, Kiran Raana and Supriya

Abstract
Uttarakhand state is blessed with thousands of plants species. About 320 species have been identified having medicinal value. Various studies in the state shows that the major constraints in the MAP cultivation are high initial cost in production, poor quality of inputs and delay in their supply, lack of awareness about loan feasibility and incentives, no transparency in the trade, particularly on procurement source, and high processing cost. It has been suggested that concerted efforts should be made to address these constraints and increase access to the world market.

Keywords: Medicinal & Aromatic plants farming

Introduction
Medicinal and aromatic plants constitute a major segment of the flora, which provides raw materials for use in the pharmaceuticals, cosmetics, and drug industries. The indigenous systems of medicines, developed in India for centuries, make use of many medicinal herbs. These systems include Ayurveda, Siddha, Unani, and many other indigenous practices. More than 9,000 native plants have established and recorded curative properties and about 1500 species are known for their aroma and flavour. In one of the studies by the World Health Organization, it is estimated that 80 per cent of the population of developing countries relies on traditional plant based medicines for their health requirements (WHO, 1991). Even in many of the modern medicines, the basic composition is derived from medicinal plants and these have become acceptable medicines for many reasons that include easy availability, least side effects, low prices, environmental friendliness and lasting curative property. India and China are the two major producing countries, having 40 per cent of the global biodiversity and availability of rare species. These are well known as the home of medicinal and aromatic crops that constitute a segment of the flora, and provide raw materials to the pharmaceutical, cosmetic, fragrance, flavour etc. industries. The aromatic plants are the important economical source of a number of well established and important drugs; in addition, they are the source of some chemical intermediates needed for the production of a number of drugs.
India has been considered a treasure house of valuable medicinal and aromatic plant species. The Indian System of Medicine uses over 1,100 medicinal plants and most of them are collected from forests regularly, and over 60 species among them are particularly in demands. On account of the fact that derivatives of medicinal and aromatic plants have no side effects and deal curatively, the demand for these plants is on the increase in both developing and developed countries. As a result, the trade of medicinal plants is increasing fast. From the trade data available, it is clear that the global market for medicinal plants has always been large and has been on increase in the recent past. In the report commissioned by the World Wide Fund for Nature, it is pointed out that, the total import in 1980 of "vegetable materials used in pharmacy" by the European Economic Community was 80,738 tons. India was the largest supplier with 10.05 tons of plants and 14 tons of vegetable alkaloid and their derivatives. India, Brazil and China are the largest exporters of medicinal plants. Trade of medicinal plants from India is estimated to be worth Rs. 550 crore. Cosmetics and aromatherapy products are two important areas where Indian medicinal plants and their extracts like essential oils can

contribute globally. Medicinal and aromatic plants have a high market potential with the world demand for herbal products growing of the rate of seven per cent per annum. Aromatic plants provide products with are extensively used as spices, flavouring agents and in perfumes and medicine. In addition, they also provide raw materials for the production of many important industrial chemicals.

The spices and essential oil industry traditionally was only a cottage industry in India. Since 1947 a number of industrial organizations have been established for large scale processing and production of spices, oleoresins, essential oils, their pure constituents and perfumes. The essential oils which are being produced in India are oils of ajwain, cedar wood, celery seed, citronella, eucalyptus, lemon grass, mentha, spearmints, Palmarosa, patchouli, turpentine and votive. Some of these products are the raw materials for the production of important industrial chemical like β-ionone from lemongrass oil for the production of vitamin A. India produces turpentine oil in the order of 10,000 to 35,000 tons annually and this oil is used for the production of a number of chemicals. The essential oils are used in every-day human-life in various ways and their consumption is rapidly increasing. A few of the common uses to which essential oils and their derivatives are put to, are in the manufacture of soaps, cosmetics, pharmaceutical preparation, confectionary, aerated waters, disinfectants, detergents, incenses, etc.

As compared to the traditional crops, the cultivation of medicinal and aromatic crops have many advantages. These include:

- Medicinal crops provide better returns than traditional crops
- Have very high domestic and export demand
- Fetch better prices in the market
- Could be stored for long time, and sold at a time when better prices prevail in the market
- They are largely drought tolerance, and not easily gazed by animals.
- Have low incidence of pest attack and diseases
- Require minimum resources, therefore cost of cultivation is lower compare to traditional crops.
- Could be raised as inter-crop along with traditional crops, also on degraded lands.

Overview of Medicinal and Aromatic Plants in Uttarakhand

Uttrakhand, located at the foothills of the Himalayas, is characterized by diverse geographical features ranging from snow-capped mountain peaks in the North to tropical forests in the South. It has been divided into two regions- the western region- Garhwal mandal and the eastern region Kumaon mandal. The State is having about 61.1% area under forests. In 2012-2013 the state exported culinary herbs & aromatic produce worth 29.0 crore (shm.uk.gov.in). Uttrakhand state has great diversity of high value medicinal plants and therefore designated as Herbal state or AYUSH Pradesh. Uttrakhand has observed an increase in the area under cultivation of aromatic and medicinal plants. The State is blessed with thousands of species. About 320 species have been identified having medicinal value. The forest department has reported about 175 species being commercially exploited and traded. The number of species reported for Kumaon is 304 while 288 is reported for Garhwal region. It is estimated that the state is well positioned to generate revenue of about 1, 000 crore annually through medicinal herbs trade. (NRIF, 2004).

Infrastructure for R & D in Medicinal and Aromatic Plants in Uttarakhand: The state has a good network of state and central government institutions which can provide good research and development inputs into the sector. (ICFRE, WII, FRI, BSI, GBPIHED, CIMAP, CDRI, HAPPRC, Universities). There are also a number of NGOs like COMFORPTS, SHER, VCPCR, FES etc who continue to play an important role in the development of the sector. Uttarakhand has been declared a herbal state, and for taking care of the multifarious aspects of the MAP sector, Herbal Research & Development Institute at Gopeshwar (1989) has been named as the apex agency in 1989 for conservation, development and sustainable utilization of the valuable Medicinal and Aromatic Plant resources of Uttarakhand. The major developments are:

1. Three nurseries in each block.
2. Herbal gardens in every district.
3. 70 collection centres connected to mandis at Rishikesh, Tanakpur and Ramnagar.
4. Provision of manpower for research and development.
5. Farmers to get training in herbal cultivation and post-harvesting techniques.
6. Certification for content at laboratories in Gopeshwar and Selaqui.
7. Creation of the State Plant Board office in the capital.

Infrastructure for Processing Facilities in the State: Since the collection of herbs from wild is in vogue in the state for a long time, some of the infrastructure for processing and marketing of these herbs has developed over time. In a survey carried out by HRDI, information was collected on the number of ayurvedic pharmacies in different districts, their input use and the products manufactured by them. The survey results suggest that there are 101 ayurvedic pharmacies located in Uttarakhand, of which 80 percent are located in two adjoining districts of Dehradun and Haridwar.

Similarly the CAP, Selaqui has compiled information on the number of distillation units for aromatic plants both in the institutional and also private sectors. There are 109 distillation units in the states. Out of which 66 percent are in the institutional domain while the remaining 34 percent have been set up by private entrepreneurs. This positive attitude of farmers towards aromatic plant cultivation is because of the high returns from this crop. Intercropping of aromatic plants with food grains can also help diversify the income basket for small and marginal farmers. Aromatic plants helped farmers to generate revenue of Rs. 35.38 Lakhs in 2006-07 and 63.40 Lakhs in 2011-12. Farmers can derive huge benefits by diversifying into the cultivation of aromatic plants. These benefits have been generated with the help of the Herbal Research and Development Institute (HRDI) that works on aromatic plants used in cosmetics, soaps, and perfumes.

The National Medicinal Plant Board has identified about 32 species for mass cultivation out of which Government of Uttarakhand laid emphasis on about 10 species, which have been chosen for cultivation in Uttarakhand. Table-1 shows that the number of farmers engaged in cultivation of aromatic plants in the state has dramatically increased from 3409 in 2009-10 to 18341 in 2014-15 and the area under aromatic plants has increased hundred-fold.

Table 1: Area and number of farmers engaged in cultivation of aromatic plants in Uttarakhand

Year	No. of farmers	Area(ha)
2009-10	3409	927
2010-11	5974	1884
2011-12	8596	3161
2012-13	11875	4487
2013-14	14960	6017
2014-15	18341	7593

Source: CAP, Selaqui, Annual Report 2009-10 to 20014-15)

Also the production of essential oils has increased ten times from 12 quintals in 2003-04 to 1117 quintals in 2012-13 (Table-2). This positive attitudes of farmers towards MAPs cultivation is because of the high returns from this crop. Intercropping of aromatic plants with food grains can also help to diversify the income basket for small and marginal farmers. Table -3 shows area under major aromatic plants.

Table 2: Production of essentials (quintals) from aromatic plants

Year	Production of essentials(quintals)
2003-04	12
2004-05	41
2005-06	74
2006-07	100
2007-08	147
2008-09	196
2009-10	252
2010-11	432
2011-12	695
2012-13	1117
Source: www.oiirj.org	

Table 3: Area under Aromatic Plants

Sl. No.	Name of aromatic plant	Area under aromatic plants (in hectares)
1	Lemongrass	74.89
2	Citronella	6.64
3	Basil	18.60
4	Geranium	18.02
5	Palma Rosa	21.30
6	Jamarosa	13.50
7	Tagetus	3.5
8	Chamomile	8.20
9	Stevia	2.00
10	Rose	3.75
	Total	170.40

Source: Herbal Research and Development Institute, Govt. of Uttarakhand, Dehradun (2004)

Constraints

Although India is a leading exporter of medicinal plants in the world, the rate of growth of these crops in relation to their economic prospects is not at all satisfactory. The reasons for this apparent backwardness are many and varied. The other major constraint is marketing of the cultivated raw material because of the quality considerations. Lack of testing facilities at the procurement and trading centres together with unscrupulous market handling, results in wide fluctuations in prices, often going down to uneconomic and unrealistic levels. Thus, speculative trade has been one of the most serious deterrents to the development of this enterprise. Forest fire plays a very devastating role in the destruction of small medicinal plants. Illegal trading of banned high value medicinal plants. Excessive grazing by domestic as well as wild animals. Cutting of medicinal trees for fuel, timber, etc., and lopping of leaves for fodder and cattle bedding. Change in climate and weather pattern. Lack of awareness towards this valuable heritage. The major constraints experienced by the growers were put under three categories, viz. production, processing, and policy constraints. These constraints were barriers in cultivating MAP and restricted their area. Mital Rashi (2007) in her study revealed that major problems were: high initial cost in production, poor quality of inputs and delay in their supply, lack of awareness about loan feasibility and incentives, procedural delays in obtaining loan, and high rate of interest. There is no transparency in the trade, particularly on procurement source, price, etc. Beside these, lack of basic infrastructure, organized marketing system and processing facilities and high processing cost were the important processing constraints (Shrivastava, 2000) [1]. The lack of awareness about export market, proliferation of illegal trade and existence of intermediaries between farmers and traders were the major constraints from traders' point of view (Jairath and Agarwal, 2005) [2]. A policy should be evolved to establish distillation units near the farms so that small farmers could also avail of the opportunity.

Policy implications: Most of the studies revealed that there is need to establish processing or distillation units with adequate capacity in the production regions of MAPs, so that the quality and quantity of the product could be maintained and the growers would be able to get a higher price for their produce. Access to technical know-how and institutional credit on priority basis can help to promote these processing units. This activity should be backed with availability of planting material and support on the package of good practices for cultivation of MAPs. Research institutions should play a lead role in this direction. Lastly, the study has observed that efforts towards strengthening of the market information system and management of price risks will go a long way in developing the positive economy of MAPs cultivation.

References

1. Shrivastava, Shipra. Economics of Cultivation of Aromatic Plants in U.P. M.Sc. thesis submitted to G. B. Pant University of Agriculture & Technology, Pantnagar, Uttarakhand, 2000.
2. Jairath MS, Agarwal NL. Marketing of medicinal and aromatic plants in Rajasthan, National Consultative Workshop on Medicinal and Aromatic Plants, held at G.B. Pant University of Agriculture and Technology, Pantnagar, 2005, 28-36.
3. Malik RPS. Cultivation of Medicinal and Aromatic Crops as a Means of Diversification of Agriculture in Uttaranchal, Agricultural Economics Research Centre University of Delhi, Delhi, 2007.
4. Mitta Rashi, Singh SP. Shifting from Agriculture to Agribusiness: The Case of Aromatic Plants, Agricultural Economics Research Review Vol. 20 (Conference Issue) 2007, 541-550.
5. Ghayur Alam, Lucian Peppelenbos, Cultivation of Medicinal Plants in Uttarakhand, Economic & Political Weekly EPW march 7, 2009, xliv(10)
6. Atrey Priti. Income Generation through Medicinal and Aromatic Plants in Uttarakhand: A Case Study of District Dehradun, Online International Interdisciplinary Research Journal, {Bi-Monthly}, ISSN 2249-9598, Volume-V, Mar 2015 Special Issue
7. Annual Report 2009-15 Selaquie.