

Review article

**Entrepreneurial prospects of medicinal and aromatic plants in India-A
Review**

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ABSTRACT

Medicinal and aromatic plants provide livelihoods to the people in the country. These plants demanded by various industries as raw material to prepare various specific products. There is huge potential for medicinal and aromatic plants production and value addition in the country. Because medicinal and aromatic plants contain various chemical compounds. However various challenges are associated with value chain of medicinal and aromatic plants. Government initiatives and supports are helpful for small farmers and entrepreneurs to earn additional income and to sustain in this sector through production, marketing and entrepreneurial ventures. Entrepreneurship is important in medicinal and aromatic plants sector. Different agro-climatic conditions in India are suitable for cultivation of various types of medicinal and aromatic plants. This paper provides review on entrepreneurial opportunities in medicinal and aromatic plants.

Keywords: Certification, entrepreneurial prospects, medicinal and aromatic plants, value addition

INTRODUCTION

Medicinal and aromatic plants continue to play important role in ensuring health security of the nation and world as well. Medicinal plants contain a plenty of important chemical compounds which are used in many products. Tulsi, Ashwagandha and Kalonji are some important medicinal plants cultivated by farmers. Some organizations also stimulated a devoted cluster for the organic cultivation of these plants in the country. Some important medicinal and aromatic plants already have considered for the standardized package of practices and their cost of cultivation and return like Tulsi, Ashwagandha, Mentha, Shatavari, Kalmegh, Licorice, Lemongrass, Kalonji etc. Government promoting entrepreneurship through incubation support for medicinal and aromatic plants related venture. Technology Business Incubation

(TBI) has the requisite expertise in areas relevant to medicinal and aromatic plants and also intends to facilitate innovation and entrepreneurship. It promotes growth of medicinal and aromatic plants sector with technology and knowledge transfer. The incubation centre organizes sensitization workshops, boot camps and how to manage entrepreneurial venture, seminars or webinars to enhance the knowledge and skill of medicinal and aromatic plants stakeholders. Medi-Hub, Technology Business Incubation (TBI) program are designed to help start-ups to grow in a continuous manner by providing them the technology and business support system in medicinal and aromatic plants (Patel *et al*, 2023). Growers, retailers and wholesalers, processors, collectors, and consumers are among the various stakeholders involved in the various entrepreneurial aspects including production, marketing and trade of

medicinal plants (Parvin *et al*, 2023). The use of medicinal plants by the local people residing in the Bandarban hill district for the treatment of several human ailments has been observed (Alam *et al*, 2024).

Singh *et al* (2024) revealed various raw materials derived from medicinal plants that are used in various applications. Various raw materials for pharmaceuticals, cosmetics, natural dyes and essential oils are obtained from plants. Medicinal and aromatic plants cultivated on farms for industrial requirements, many are still collected from different wild source. There are growing demand for industrial raw materials and declining wild populations' opening new avenue for farmers to cultivate important high value medicinal and aromatic plants. Improved varieties, their seed and quality of planting materials, organic as well as natural farming, incubation and start-ups in these sector play very important to support entrepreneurial ecosystem for this sector. Peoples used medicinal plants for the treatment of numerous human ailments. These plants cultivated with other crops and through different value-adding methods, to realize sustainable development goals (SDGs) and to promote the circular economy beneficial to the environment (Singh *et al*, 2024). Abadi *et al* (2021) revealed that attitude of producers' perceived behavioural, subjective norms; and perceived costs are the important drivers of intention toward these plants. Medicinal plants produced in the Himachal Pradesh state are having immense use and potential in the herbal as well as pharmaceutical sector.

Some important medicinal and aromatic plants are suitable for cultivation due to good climatic conditions and increased demands in the Himalaya of Uttarakhand state (Phondani *et al*, 2016). For the cultivation and safeguarding of medicinal plants, agroforestry provides a useful strategy (Rao *et al*, 2004). Compared to commercial crops, medicinal plants also provide remunerative to the cultivator (Das *et al*, 2016).

METHODOLOGY AND DISCUSSION

This paper attempted to review entrepreneurial perspectives of medicinal and aromatic plants. This paper is based on secondary data. The secondary data and information have been collected from different published secondary sources like published articles, research papers, annual reports, newspapers, magazines, websites etc.

Supply chain management

There is a need for a supply chain monitoring system for herbal medicine industry to ensure quality control and improve relations among and between the various herbal medicine industry value chain players (Obahiagbon and Ogwu, 2023). Seed suppliers were the highest value-adding actor for Tulsi (*Ocimum tenuiflorum*). Planning and development of a favourable ecosystem for medicinal plant production, processing, and marketing, this sector may flourish for the long term sustainability (Palash *et al*, 2021). Supply chains of medicinal plants are erratic and require sustainability in their chain like production, harvesting, processing, and its marketing. In order to become competitive in the medicinal plants global market place, value chain must become more elastic, innovative, and efficient, so it can bring to market new products (Hishe *et al*, 2016). Singh *et al* (2024) revealed that starting successful farming models requires identifying suitable crops through GIS-based agro-ecological studies. It involves assessing climatic suitability and details of Good Agricultural Practices (GAP). Supporting with this, methods such as organic cultivation and advancements in genetics and biotechnology notably improve medicinal plant quality and production.

Certification and traceability

The chemical details of the plants, active ingredient their extraction methods, country of origin, climatic and specific crops are important quality factors. Economic factors are related to demand and supply (Lubbe and Verpoorte, 2011). Medicinal and aromatic plants as source of raw materials are purchased directly from farmers by the

Traditional Medicine Service Institute (Dhuguel, 2013). Certification of organic medicinal and aromatic plants leads to important economic growth and development in the industrial sector (Cader *et al*, 2021). The current harvesting practices are unsustainable (Sharma and Kala, 2018). The certification of these plants supports the development of enterprises in the sector and reduces the risk of rejection and the self-reliance of buyers in the market (Kala, 2015). Quality certification and certification of origin encourage customers, small businesses, and entrepreneurs (Taghouti *et al*, 2022). The content in the local language as well as the use of multimedia is necessary for traditional knowledge (Kareti *et al.*, 2022). According to Anonymous (2021) ensuring traceability through proper labelling and packaging of products is very essential and a crucial requirement or mandatory for organic products. The creation of a batch number also helps with traceability and identification of the products (Shrestha *et al*, 2022). Factors influencing production include an insufficient of quality planting materials, lack of appropriate agro-techniques, insufficient market information, and a lack of good agricultural practices (GAP) for organic production. Lack of value addition, there is no price parity with wild produce (Sunder *et al*, 2012).

The roles of value chain are not efficient various paths in the chain are unorganized. The medicinal and aromatic plants value chain consists of inbound logistics, transporting, storing raw and harvested plants collection at the local and state level (Chandra and Kumar, 2021). Routroy and Behera (2017) suggested inventory policy, demand forecasting was found to be important areas of agricultural supply chain

Grading, processing, value addition and packaging

Sun drying, artificial drying, and tray drying are important techniques for drying collected medicinal plants (Porwal *et al*, 2020). The post-harvesting process can involve

segregating various important parts of medicinal and aromatic plants, including plants leaves, fruits, bark, and seeds. (Phondani *et al*, 2016). Harvested plants require proper drying to conserve their quality, and for that, alternative day turning is required (Parmeshwar *et al*, 2020). Most of the time, processors grade their products in various forms, like dry and powder forms (Palash *et al*, 2021). Option of essential oil extraction can get a higher remunerative return (Thakur *et al*, 2016). Plastic and jute bags commonly used for storing as processing for fresh and dry plants, but only polythene bags are used for powder form (Palash *et al*, 2021). The important benefit of the certification of medicinal plants is enhanced quality and it leads to good prices of the plants.

Storage

The maximum amount of limonene as well as the desired constituents of citral was observed in leaves packed with nitrogen (Ebadi, 2016). Medicinal and aromatic plants are frequently stored before use it for longer time (Mahmoodi Sourestani *et al.*, 2014). Storage was species-specific due to the degree of changes in phytochemical and pharmacological activity of the plants (Laher *et al*, 2013). Through oxidation and, decomposition chemical effect can be protected by the exact choice of packing material (Huyan *et al.*, 2019). The longer the storage time, result some important antibacterial properties lost (Susilo *et al*, 2020). The herbs packaged in aluminium balls and aluminum plates covered with foil and stored at three degrees celsius maintained their chlorophyll content as well as fresh weight and achieved a longer shelf life. Collection from forest collecting gives the highest net benefit to the household (Astutik *et al*, 2023).

Marketing information

The trade-in medicinal and aromatic plants are unorganized, and there is no reliable information about market prices (Singh and Kumar, 2021). Consumers preferences for freshness, organic production, and traceability

over low prices of medicinal and aromatic plants should be encouraged (Kevin *et al*, 2014). A database of medicinal plants would help users readily acquire and needed information (Kumar *et al*, 2018). Chandra and Sharma (2018) proposed a marketing information system that would be helpful in linking trade of important medicinal plants. Market intelligence helps in price forecasting also helps in getting good return price for the medicinal plants (Sunder *et al*, 2012). Information technology methods have remained some adopting digital knowledge to sustain traditional knowledge of medicinal plants to preserve and disseminate traditional knowledge in the medicinal plant sector (Kareti *et al*, 2022)

Conclusion

The paper highlighted the potential of medicinal and aromatic plants to full fill the raw material requirement of different industry. The medicinal and aromatic plants are potential sources of active important chemical compounds. Production and marketing of these important medicinal and aromatic plants provides a livelihood for millions of peoples and it open new avenue for entrepreneurship in this sector. The role of government is crucial in the production, marketing, and sustainability of medicinal plant sector. The seed, bark, roots, stem and leaves are source of raw materials for the pharmaceutical, industries including herbal, and cosmetic. There is huge potential for value-added and herbal products of medicinal and aromatic plants, so farmers or growers could cultivate on a large scale to generate additional source of income, while people may get the health benefits of herbal products for improving their health. There is a need for an efficient supply chain management of these plants. In this sector there are opportunities for entrepreneurship of medicinal and aromatic plant-based resources and raw materials. Overcoming the constraints would benefit both primary producers or growers and stakeholder involve in the medicinal and aromatic plants supply chain.

CONFLICT OF INTEREST STATEMENT

The author declares that he has no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Table 1: Certification and traceability of medicinal and aromatic plants

Particular	Emphasises /Suggested	Study/Author
Certification and Traceability	Organic certification of medicinal and aromatic plants	(Cader <i>et al</i> , 2021)
	Quality certification and certification of origin	Taghouti <i>et al</i> , 2022)
	Traceability and identification of the products	Shrestha <i>et al</i> , (2022)