



## A Review on Cost and Return of Medicinal and Aromatic Plants Cultivation in India

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### Article History

Received on 08<sup>th</sup> November, 2023

Received in revised form on 04<sup>th</sup> February, 2024

Accepted in final form on 20<sup>th</sup> February, 2024

### Abstract

The present study was conducted during 2022–23 to review the cost and return of medicinal and aromatic plants cultivation. Relevant and scholarly articles of various researchers were reviewed. The articles were searched using the keywords “medicinal and aromatic plants” along with cost and return, cultivation. Scientific platforms such as Google Scholar and Scopus were searched, along with, annual reports, magazines, newspapers, medicinal plants board websites etc. The reviews compiled collective information on cost and return, benefit cost ratio. Medicinal and aromatic plants provide a higher return compared to traditional crops. The medicinal and aromatic plants also can be grown with other crops as mixed cropping. However, marketing is an important constraint in cultivation. Understanding the economics of cultivation of medicinal and aromatic plants is an important step in designing future policies. This paper tries to fill the gap and contributes literature on cost and return of cultivation of medicinal and aromatic plants, which may be helpful in improving the linkages of value chain of the sector. Many business firms coming in buy back agreement with farmers for procurement and marketing of their medicinal and aromatic plants. Understanding the cost and return of medicinal and aromatic plants is important for designing future policies to deal with to overcome the challenges and formulate a suitable and sustainable value chain for the sector.

**Keywords:** Cultivation, cost and return, medicinal and aromatic plants

### 1. Introduction

Cultivation of medicinal and aromatic plants highly remunerative both in financial and economic terms for the small-scale farmers. Cultivation needs to be done on a business platform by a chain of micro and small farm enterprise based groups and individuals when cultivated it on small land.. Medicinal plants are provides the means of livelihood to a large number of populations. In a broader aspect, there is a growing demand for plant based herbal medicines, health products, pharmaceuticals, food supplements, cosmetics, etc. in the national and international markets. Medicinal plants sector has a number of stakeholders including local collector of medicinal plants, middlemen, traders, processor and herbal and cosmetics industry having divergent interests in buying medicinal plants. Medicinal and aromatic plants play an important role in meeting the demands of the traditional medicine markets (Dar, 2017). Medicinal and aromatic plants products used by people for phytotherapeutic or cosmetic purposes (Cadar et al., 2021) Kalmegh cured different ailments and is known for its wide medicinal properties. (Abirami et al., 2021). According to Anonymous (2018) growing medicinal

herbs and aromatic plants, a group of farmers are earning as much as ₹ 3 lakh acre<sup>-1</sup> profit. The important herbs are Shankpushpi, Karanja, Kuth, Ateesh, and Kapikacchu. The efficient value chain of the crop helps in increasing production, marketing, and export opportunities. *Ghritkumari* gives ₹ 92,876; Turmeric ₹ 73,725, while Tulsi ₹ 35,515 return acre<sup>-1</sup> over variable cost, which is comparatively higher than the traditional crops. (Singh et al., 2023). Medicinal plants like Senna, Tulsi and Aswagandha provide opportunity to transferred unproductive fallow lands into productive hub for medicinal plants (Dharumarajan et al., 2016). Medicinal plants production is a profitable alternative to traditional crops (Saiyam et al., 2022). Medicinal and aromatic plant-based cropping systems are more remunerative than traditional crops. However huge marketing and promotion efforts are required (Dar et al., 2017). Collection, primary processing and selling of medicinal plants contribute to the cash income of the poor men and women people (Gaurav et al., 2018). Lack of marketing facility is important constraint (Rathore, 2022) The trade-in medicinal and aromatic plants are unorganized, and there is no reliable information about market prices (Singh



and Kumar, 2021). Mucilage and laxative contain in Isabgol used to treat constipation (Katke, 2020). Laxative properties of Sennoside from senna used to treat stomach ache (Kumar et al., 2022). Somniferene contain in Ashwagandha use as, antigenotoxic, anti-aging and anti angiogenic (Saranya et al., 2019; Chandra et al., 2023). Emblicanin of Amla used in treatment of jaundice (Raghuvanshi et al., 2021). Brahmi used as antioxidant and in memory enhancing drug (Joseph et al., 2020; Shakti et al., 2023).

Sou et al. (2022) concluded that 69.17% farmers were having medium level of knowledge regarding Isabgol production technology, followed by 15.83% and 15% of the farmers were falling under high and low level of knowledge respectively.

Giloy used as immunomodulatory (Gowthami et al., 2021). Ursolic acid and linalool contain in Tulsi used as fragrant in perfume industry (Das, 2022). Citral is important chemical contain in lemon grass use as anti-inflammatory (Spruha et al., 2021). Gum and resin of guggal used anti-inflammatory and diuretic (Negi et al., 2015). Rosemary used as aromatic flavor (Verma et al., 2020). Marketing is a major issue for medicinal and aromatic plant cultivation. Saponin derived from satawari used as allelopathic, bronchitis (Saran et al., 2020). Essential oil extraction from aromatic crops can give a higher remunerative return (Thakur et al., 2016). Herbal medicines should be promoted for the animal wellbeing, better husbandry benefits and good public health (Basak et al., 2020).

## 2. Collection of Data

The present study was conducted during 2022–23 to review the cost and return of medicinal and aromatic plants cultivation. The present study is based on secondary data. The secondary data have been collected from various research papers, articles, magazines, annual reports on medicinal and aromatic plants, newspapers, websites etc. Relevant and scholarly articles of various researchers were reviewed. An electronic literature search was carried out to identify relevant literature. The literature search was peer-reviewed articles, reviews, book chapters, magazines, newspaper, annual reports. Various scientific platforms like Google scholar, Scopus etc. were searched using key words medicinal and aromatic plants cultivation cost and return etc. Synthesize the results of published studies related to cost and return of selected medicinal and aromatic plants and their uses. The paper highlights cost and return of cultivation of medicinal and aromatic plants.

## 3. Benefit Cost Ratio of Medicinal and Aromatic Plant Cultivation

The cost of cultivation per acre of Isabgol and Patchouli in Maharashtra was calculated ₹ 3,994.46 and ₹ 32,707.17, and the return was ₹ 5,172 and ₹ 1,01211, respectively. The returns from Patchouli were higher than Isabgol. (Jadhav et al., 2001). Christaki (2012) concluded extracts and essential

oils of aromatic plants contain a variety of functional bioactive compounds. The cost of cultivation of henna in the Pali district of Rajasthan especially skilled labour is required for its transplanting, and 55% of labour costs alone account for the total establishment cost. The overall cost incurred was ₹ 8,464 ha<sup>-1</sup>, with labour accounting for 94% (Chand et al., 2002).

Patra et al. (2004) calculated the economics of Ashwagandha cultivation. The cost of cultivation ha<sup>-1</sup> was calculated. Gross return and net return were ₹ 27,500 and ₹ 22,500, respectively. The average maintenance cost per hectare amounted to ₹ 71907.73 in the production and marketing of patchouli in North Karnataka. The gross return and net return were found to be lowest in the first year, highest in the second year, and decreasing in the third year (Raghu, 2006). The average cost (Cost C2) incurred in Isabgol cultivation was ₹ 16974 ha<sup>-1</sup> and the average yield was obtained at 9.40 q ha<sup>-1</sup>. The average gross return was ₹ 16974 ha<sup>-1</sup>. For Isabgol cultivation, an investment of one rupee gives returns of ₹ 1.61 (Anonymous, 2007).

Isabgol an important medicinal herb, requires improvement in

Table 1: Benefit Cost Ratio of Medicinal and Aromatic plant cultivation

Medicinal plant and aromatic plant	Study area	Benefit cost ratio	Reference/ study
Isabgol	Rajasthan	1.65	Rathore and Mathur, (2020)
Isabgol	-	1.61	Anonymous (2007)
Lemon grass, Aloe vera, Safedmusli, Stevia	Himachal Pradesh	1.19, 1.22, 1.30 and 1.27	Guleria et al. (2014)
Mentha	Uttar Pradesh	1.17	Singh et al. (2019)
Aloevera (Ghritkumari)	Rajasthan	1.17 @ 15% discount rate	Rathore, (2022)
Safed Musli	Madhya Pradesh	1.2	Rajak and Sarawagi (2017)
Tulsi	Uttar Pradesh, Gujarat	2.70, 1.39	Sharma et al. (2019) Saran et al. (2018)
Palmarosa	-	2.59	Suresh et al. (2014)
Jalbrahmi	Gujarat	3.14	Parmeshwar et al. (2020)



seed yield to meet world demand for its seed husk (Bhardwaj et al, 2020). The cost of production of Shatavari fluctuated, the total cost was ₹ 25, 000 ha<sup>-1</sup>, gross income was ₹ 50,000 ha<sup>-1</sup>, and net income was ₹ 25, 000 ha<sup>-1</sup> (Charan, 2013). The annual cost of capital is the most important element of the production cost of organic Aloe vera, it contributes 42% of total expenses. With regard to variable costs, shipping costs are an important cost element (Liontakis and Tzouramani, 2016)

According to Anonymous (2016) economics of some important aromatic plants of India, total expenditure in the cultivation of Palmarosa incurred about ₹ 40,000 and it gives net return of ₹ 1,20,000 with a yield of 125 to 150 kg of oil with a market rate of oil at ₹ 1400–1500 kg<sup>-1</sup>.

Anonymous (2016) the input cost includes seeds, fertilizers, labour costs, and logistic costs of 60,000 acre<sup>-1</sup> of stevia for a yield of 500 kg of leaves acre<sup>-1</sup> in each harvest (1500 kg in three harvests a year). Seeds and stem of the stevia plant are also good sources of income. The farmer is producing the best quality dry processed roots of whatever due to contracts with emerging pharmaceutical companies. They sell roots in local and regional agricultural markets and earn good profits (Anonymous, 2017). The average per farm fixed cost of capital was ₹ 189062.50 and ₹ 74250 ha<sup>-1</sup> in Pratapgarh, Uttar Pradesh. The cost of the plantation of Aonla was ₹ 47000. The cost of production of *Safedmusli* was found at ₹ 15424.8 q<sup>-1</sup>. The production of medicinal plants in Chir Pine Forest is economically feasible with increased yield and improved rural livelihood and economy in the states Chir pine forest of the mid-hills of the North-West Himalaya (Sanwal et al., 2017)

#### 4. Conclusion

The value chain and its role are neglected, and many paths in the chain are unorganized. The cultivation of medicinal and aromatic plants are economically profitable than traditional crops. Majority of the medicinal plants parts like stem, root, bark used in health care system and demanded by various industries. Medicinal and aromatic plants are good source of income for the farmers. However, there are challenges in marketing of medicinal plants.

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