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# Challenges in Sesame Production and Marketing: Insights from Kerala's Onattukara Region, India

**Kumar Charan Krishna [a*], Aswathy Vijayan [a], Anil Kuruvila [a], Lovely. B [b] and Pratheesh P Gopinath [c]**

*[a] Department of Agricultural Economics, Kerala Agricultural University, College of Agriculture, Vellayani, Thiruvananthapuram, India.*
*[b] Department of Plant Breeding and Genetics, Kerala Agricultural University, College of Agriculture, Vellayani, Thiruvananthapuram, India.*
*[c] Department of Agricultural Statistics, Kerala Agricultural University, College of Agriculture, Vellayani, Thiruvananthapuram, India.*

***Authors' contributions***

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## ABSTRACT

Sesame is one of the nine major oilseeds grown in India, with cultivation spread across every state. Although sesame is grown in 11 districts in Kerala, the sesame cultivated in the Onattukara tract has unique characteristics. In Kerala, sesame is cultivated on 326.51 hectares, with a total production of 163.1 tonnes and a productivity rate of 499 kg per hectare. This study aims to analyze the challenges faced by farmers in the production and marketing of sesame in the

**Corresponding author: E-mail: kumar-2022-11-068@student.kau.in, charankrishna7170@gmail.com;*

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Onattukara region of Kerala. The districts of Alappuzha, Pathanamthitta, and Kollam were purposively selected for the study, as the Onattukara region is located within these three districts. A total of 163 farmers were included in the sample, comprising eighty farmers each from Kollam and Alappuzha districts and three farmers from Pathanamthitta. Constraints faced by farmers in sesame cultivation were ranked using the Garrett ranking technique.

Sesame cultivation in the Onattukara region faces various challenges in both production and marketing, such as inadequate seed availability, high input costs, low yields, labor shortages, low prices, weather-related issues, price fluctuations, delayed payments, low demand for the final product, and the lack of institutional market mechanism. Similarly, sesame processing unit owners also encounter issues in production and marketing, including raw material shortages, a lack of skilled labor, poor raw material quality, costly production methods, lack of support, low product prices, price volatility, inadequate storage facilities, inefficient markets for final products, and limited consumer awareness.

A micro-level study on sesame production and marketing would help producers make informed and specific decisions to improve their income. These insights can guide producers in making informed decisions and assist policymakers in implementing corrective measures like resource allocation for inputs, training and capacity building, improving market linkages to enhance sesame production, productivity, and market stability. These interventions, grounded in micro-level data, could substantially support both short-term gains and long-term sustainability in sesame production, demonstrating the practical utility of the research in enhancing both farmers livelihoods and local agricultural policy.

*Keywords: Constraints; Garrett ranking technique; marketing; Onattukara sesame; production.*

## 1. INTRODUCTION

Sesame (*Sesamum indicum* L.), one of the oldest oilseed crops known for its high-quality oil, is grown in tropical and subtropical regions of Asia, Africa and South America (Zhang, 2013). According to the Directorate of oil seed, during 2019-20 sesame is grown 16.23 lakh ha with production of 6.58 lakh tonnes and productivity of 405 kg/ha (Ranganatha, 2023). Although Kerala is not a major sesame-producing state, it has a long tradition of growing the crop, with 326.51 hectares under cultivation, yielding 163.1 tonnes and a productivity of 499 kg/ha (GOK, 2023). In 2023-24, sesame cultivation in Kerala expanded to 417.11 hectares. Plans to expand sesame cultivation to 750 hectares are underway as part of a crop diversification initiative.

Sesame is grown in 11 districts of Kerala, but the sesame grown in Onattukara region has earned a Geographical Indication (GI) tag. Onattukara is an important agricultural area in Central Travancore, covering parts of Alappuzha, Kollam, and Pathanamthitta districts. This region includes Karthikapally and Mavelikkara taluks in Alappuzha, Karunagappally and parts of Kunnathoor taluks in Kollam and Pandalam municipality in Pathanamthitta district.

Despite this, sesame cultivation in Onattukara faces many challenges. A focused study on sesame production and marketing would help farmers make better decisions and improve their income. It would also provide valuable insights for policymakers to develop strategies to boost sesame production and productivity.

## 2. MATERIALS AND METHODS

The study utilized a purposive sampling approach to capture a representative sample of sesame farmers from the key sesame-growing areas within the Onattukara region of Kerala. By selecting gram panchayats and the Pandalam municipality with the highest sesame cultivation area across Alappuzha, Pathanamthitta, and Kollam districts, the sampling method ensured that the area's most significant for sesame production were included. From each chosen panchayat, twenty farmers, along with three farmers from Pandalam municipality, were randomly selected, resulting a total sample size of 163 farmers. This method allows for a diverse representation of farming practices, crop yields, and challenges within the region, providing a robust basis for analyzing both production and market-related issues relevant to the wider sesame farming community. Both primary and secondary data was utilized for the study, with primary data collected directly from sesame farmers using a structured interview schedule.

To analyse the challenges faced by farmers in sesame production and marketing, the Garrett ranking technique was employed. This method will help to identify and rank the key constraints, providing valuable insights into the production and marketing difficulties experienced by sesame farmers in Onattukara.

## 2.1 Garrett Ranking Technique

The Garrett ranking technique is a statistical tool used to rank factors or items based on respondents' preferences or perceived importance. It is particularly useful in agricultural, social science, and market research to systematically evaluate and prioritize factors that affect decision-making processes. The Garrett ranking method was utilized to rank the challenges faced by farmers in sesame production and marketing. Farmers were asked to assess various constraints and steps involved in this method includes identify key factors, convert ranks to scores, calculate average scores, rank factors by priority, and their rankings were converted into percentage positions using a specific formula.

$$\text{Per cent Position} = 100\ (R_{ij}-0.5)/N_j$$

Where,
$R_{ij}$ is the rank assigned to the $i^{th}$ constraint by the $j^{th}$ farmer is the subject of analysis. The number of constraints ranked by the $j^{th}$ farmer is denoted by $N_j$. The percentage position of each rank is converted into a Garrett score. For each constraint, the total score for individual respondents is calculated. The total score values are then used to determine the mean score for each constraint. Once the mean scores are evaluated, the constraints are ranked in descending order based on these scores. The constraint with the highest mean score is identified as the most significant challenge (Garrett, 1969).

## 3. RESULTS AND DISCUSSION

The study explored the challenges faced by farmers in sesame cultivation and marketing. During the pilot survey, both farmers and sesame processing unit owners were asked to identify the key production and marketing issues they encountered. These identified constraints were later ranked by the respondents in the main survey. Garrett's ranking technique was used to analyze the data. The analysis of constraints was organized under four main categories to provide a structured understanding of the issues.

### 3.1 Constraints Faced by the Sesame Farmers during Production

The study outlined and ranked the key challenges faced by farmers in sesame cultivation based on their feedback. Key challenges include weather-related issues receiving a Garrett score of 67.99, followed by low yield (58.44), inadequate availability of seeds (57.45), shortage of labor (38.84), high price of inputs (38.35), and pest and disease infestation (38.33). Specifically, weather-related problems, such as irregular rainfall and excessive water stagnation in fields, lead to wilting leaves and resulted in decreased yields and overall production. The agronomic activities were affected due to the shortage of labor in the study area. Furthermore, there is inadequate availability of seeds and they felt that the seeds costs high.

The findings aligned with the research conducted by (Sreepriya, 2019), who identified the constraints faced by sesame farmers in Kerala. In their study, the primary challenges included high labor costs (ranked 1, score 39.86), excessive rainfall (ranked 2, score 37.40), drought (ranked 3, score 28.10), weed infestation (ranked 4, score 22.63), labor shortages (ranked 5, score 14.63), pest and disease problems (ranked 6, score 14.53), marketing difficulties (ranked 7, score 7.70), transportation and processing issues (ranked 8, score 6.43) and storage challenges (ranked 9, score 5.73).

Similarly, the study was consistent with (Teja, 2022), who investigated the production constraints faced by farmers cultivating groundnut, sesame, and sunflower in Andhra Pradesh. They utilized Garrett's ranking technique to evaluate the intensity of various challenges reported by respondents. The study identified several key constraints at the farm level, including the limited availability of suitable high-yielding varieties and hybrids, moisture stress, high production costs, delayed availability of inputs, and fluctuating low market prices.

Other study by (Dossa, 2023) conducted an economic analysis of sesame farming in Northern Benin, identifying key challenges that hinder production. These challenges include high labor costs, limited availability of labor, restricted access to land, inconsistent ripening of crops, inadequate storage facilities, and a lack of access to improved seed varieties. Such factors

**Table 1. Constraints faced by the sesame farmers during cultivation**

| Sl. No. | Constraint | Garrett's score | Garrett's Ranking |
|---|---|---|---|
| 1 | Weather related issues | 67.99 | I |
| 2 | Low yield | 58.44 | II |
| 3 | Inadequate availability of seeds | 57.45 | III |
| 4 | Shortage of labour | 38.84 | IV |
| 5 | High price of inputs | 38.35 | V |
| 6 | Pest and disease infestation | 38.33 | VI |

**Table 2. Constraints faced by the sesame farmers during marketing**

| Sl. No. | Constraint | Garrett's score | Garrett's Ranking |
|---|---|---|---|
| 1 | Low price | 68.87 | I |
| 2 | Price fluctuation | 52.8 | II |
| 3 | More demand for oil than seeds | 44.96 | III |
| 4 | Delay in payment | 43.84 | IV |
| 5 | No institutionalized market mechanism | 38.49 | V |

**Table 3. Constraints faced by the processors in the production of sesame oil**

| Sl. No. | Constraint | Garrett's score | Garrett's Ranking |
|---|---|---|---|
| 1 | Shortage of raw material | 66.67 | I |
| 2 | Shortage of skilled labour | 53.93 | II |
| 3 | Inadequate availability of quality in raw material | 44.93 | III |
| 4 | Costly method of production | 43.06 | IV |
| 5 | Poor government support | 40.4 | V |

**Table 4. Constraints faced by the sesame processing unit owners in the marketing of sesame oil**

| Sl. No. | Constraint | Garrett's score | Garrett's Ranking |
|---|---|---|---|
| 1 | Low price for produce | 67.6 | I |
| 2 | High price fluctuation | 57.6 | II |
| 3 | Inadequate storage facilities | 49.9 | III |
| 4 | Lack of efficient market for final product | 38.6 | IV |
| 5 | Lack of awareness about the unique quality of Onattukara sesame. | 35.2 | V |

significantly affect the viability and productivity of sesame cultivation in the region.

Other study by (Pawar, 2023) conducted an economic analysis and assessed resource use efficiency in sesame cultivation in Haryana. Growers highlighted several significant challenges in both production and marketing, including the prevalence of low-yielding varieties (86.66%), limited input utilization (78.33%), and issues related to seed shattering (70.55%).

## 3.2 Constraints Faced by the Sesame Farmers during Marketing

In terms of marketing challenges, the primary constraint faced by farmers is the low price received for their produce, which has a Garrett score of 68.87. This is followed by price fluctuations (52.8), low demand for the final product (44.96), delay in payment (43.84) and the absence of an institutionalized market mechanism (38.49). Most of the consumers prefer sesame oil rather than seeds. In the study area, many producers sell their harvests to nearby consumers due to the absence of an established market system. A similar study by (Ali, 2015), examined factors affecting sesame marketing in Jigawa State, Nigeria. It found that wholesalers face challenges such as limited access to credit (47.5%), low prices (40%) and delayed credit payments (15%). These delays often stem from trust issues related to credit arrangements. Another study by (Singh, 2022), who analysed on the constraints in the production and marketing of sesame and mustard using the Garrett ranking method, yield results that were contrary to those of my study. In their findings, delays in payment for sesame growers were ranked fifth with a score of 50.05, while price fluctuations were ranked eleventh with an overall Garrett score of 49.46. Another study by (Ukpe, 2023), examined the economics

of sesame marketing in Nigeria, focusing on the factors that influence farmer's market engagement and the constraints that hinder their participation. The study revealed that variables such as education and farm size significantly affect market activity. Additionally, it identified several challenges impacting participation, including lack of information (19.95%), seasonality (18.10%), inadequate storage facilities (17.52%), transportation costs (13.70%), high taxes (12.14%), distance to market (9.60%), and poor road conditions (8.96%). Another study by (Wacal, 2021), studied on analysis of sesame seed production and export trends; challenges and strategies towards increasing production in Uganda. Sesame production in Uganda faces challenges like low yields, credit access, market limitations, and land scarcity.

### 3.3 Constraints Faced by the Sesame Processing Unit Owners in the Production of Sesame Oil

The primary challenges encountered by sesame processing unit owners in the production of sesame oil included shortage of raw material, which received a Garrett score of 66.67. This is followed by a lack of skilled labor (53.93), poor quality of raw materials (44.93), increased cost of production (43.06) and inadequate government support (40.4). The shortage of raw materials ranks highest. Additionally, skilled labor is essential for processing operations, yet there is a notable shortage in this area. The poor quality of raw materials was ranked third because the seeds often contain impurities such as dust, stones and straw, necessitating costly machinery for cleaning. Finally, a significant constraint for sesame processing unit owners is the lack of governmental support. These findings align with the study by (Mary, 2023), who analysed on the constraints in the procurement and processing of sesame in Telangana. Their research identified similar challenges, including the lack of assured supply of raw materials, high prices, poor quality and substantial marketing and processing costs.

### 3.4 Constraints faced by the Sesame Processing Unit Owners in the Marketing of Sesame Oil

The main challenges faced by sesame processing unit owners in marketing sesame oil include low product prices (67.66), high price fluctuations (57.6), inadequate storage facilities (49.93), a lack of efficient markets for the final product (38.6) and limited awareness about the product (35.2). Price fluctuations create irregular market conditions each season. Additionally, there is a lack of efficient markets for sesame products, forcing processors to invest more in accessing distant markets to enhance sales and profits. Furthermore, there is limited awareness in the region regarding the benefits of sesame oil, leading to low consumer knowledge about its advantages. To address this, efforts are being made to promote awareness of the product and its benefits. These findings are consistent with the study conducted by (Mary, 2023), who examined on constraints in the procurement and processing of sesame in Telangana. Their research identified similar marketing issues, including the lack of efficient markets for final products, competition from other sesame oil producers, high sales tax rates and insufficient product awareness.

## 4. SUGGESTIONS FOR IMPROVEMENT FOR SESAME PRODUCTION

To strengthen sesame cultivation in Onattukara, where production is scattered and limited, coordinated efforts from government and non-governmental agencies are essential. Broad publicity should highlight the nutritional value of sesame seeds and oil and the unique qualities of Onattukara sesame. Farmers should be encouraged to register as authorized users to benefit from GI certification. Improved marketing, cooperative models, and connections with farmer producer organizations can diversify products and add value to sesame. Policy recommendations focus on support programs, better market strategies, GI promotion, and addressing production challenges to enhance sesame farming's economic viability in Onattukara.

## 5. CONCLUSION

The application of Garrett's ranking technique revealed significant constraints faced by farmers in production and marketing including weather-related issues, low prices received, low yield, inadequate seed availability, labor shortages, high input costs, price fluctuations, low demand for the final product, delay in payment and the absence of an institutionalized market mechanism. Recommendations and suggestions were given by officials for boosting up sesame production, which include improved agricultural practices, market development and support and policy and institutional support. By implementing these recommendations, sesame production can

be transformed into a more productive and profitable venture, benefiting farmers and boosting the agricultural economy.

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Author(s) hereby declare that generative AI technologies such as Large Language Models, etc have been used during writing or editing of this manuscript. This explanation will include the name, version, model, and source of the generative AI technology and as well as all input prompts provided to the generative AI technology.

**Details of the AI usage are given below:**

1. Artificial intelligence tool Chatgpt is only used for paraphrasing.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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