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THE GOLDEN SPICE: A SPOTLIGHT ON THE TURMERIC PROCESSORS BEHIND THE SPICE IN ERODE DISTRICT

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ABSTRACT

Turmeric, a medicinal herb with roots in ancient Indian practices, is used in food, medicine, and cosmetics. Tamil Nadu, Erode is a major producer and exporter of high-quality turmeric, known as Indian Saffron. The earthy and bitter flavour is used in various products and is valued for its medicinal properties in traditional medicine systems. Primary data was used and employed convenient sampling method; 20 processors were surveyed through interviews. The study revealed that turmeric processing units in Erode district are primarily owned by males over 50 with over 20 years of experience. They primarily produce turmeric powder, 65% of processors belonged to nuclear families and 60% of turmeric processing units sourced their turmeric finger and bulb from regulated markets in Perundurai, Nasiyanur, and Thindal. 40% of the processing unit owners were marketed to retailers followed by wholesalers. However, they face challenges like lack of cold storage facilities, limited organic market, labour scarcity, and inadequate value addition technology. Opportunities lie in medicinal and industrial applications, while threats include lower-cost competition. Turmeric's commercial and health benefits require a value addition center in Erode. Quality testing units and cluster-based interventions can improve Erode's economic status and generate revenue.

Keywords: Turmeric, Medicinal plant, Spice, Processing, Swot Analysis

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1. INTRODUCTION

Turmeric (Curcuma Longa), a medicinal herb, has its roots in Atharvaveda and Ayurveda, and was used to treat jaundice during the Sangam era of Tamils (Giri, 2020). It was a significant commodity during the Chera, Chola, and Pandian

kingdoms, and has various applications in food, medicine, and cosmetics. Turmeric, also known as Indian Saffron, is a highly valuable spice with high curcumin content, used in various industries including food, cosmetics, and pharmaceuticals (Jyotirmayee, 2022). It is also used in traditional medicine systems in India and China and is considered an ideal "Spice for Life" due to its medicinal properties (Quispe, 2021). Turmeric is inelastic in terms of price and income due to its essential nature.

Erode Turmeric is famous worldwide, with prominent cultivation areas in Erode district including Kodumudi, Sivagiri, Bavani, and more (Saravanan, 2001). Varieties grown include Erode and Salem turmeric, with Erode local, BSR-1 and 2, PTS-10, PTS-8, and Salem local being important in Tamil Nadu (Shanmugam, 2015). Local varieties occupy 70-75% of the market. Farmers in Erode cultivate PTS 10, PTS 8, and Erode local, which received a GI Tag in 2019 (Rohini, 2019). Erode local turmeric is known for its high curcumin content, golden yellow color, and resistance to pests and diseases (Daniel-Ogbonna, 2023).

Turmeric cultivation is predominantly concentrated in Dharmapuri, covering an area of 6,876 hectares, followed by Salem with 5,259 hectares and erode with 4,694 hectares in the year 2022-2023 (Season and Crop report- 2022-2023, Tamil Nadu). Overall, Tamil Nadu boasts a total turmeric cultivation area of 24,746 hectares, yielding a production of 136,370 tons during the same period. This places Tamil Nadu as the second-largest turmeric producer in India for the year 2022-23.

Erode in Tamil Nadu is a major producer of turmeric, known as the "turmeric city" (Kowshika, 2020). It is the largest market for turmeric and has a high demand for its product in countries like Bangladesh, Malaysia, and the United States. Erode produces 12 to 15 lakh bags of turmeric, meeting a significant portion of India's 40 lakh bag requirement. The turmeric industry in Erode is primarily handled by traders, wholesalers, processors, and farmers.

The majority of Chinna Nadan turmeric is grown in Erode district, particularly in areas such as Sivagiri, Kodumudi, Bhavani, Gobichettipalayam, Anthiyur, Sathyamangalam, Chennampatti, and Thalavady. In Erode district, turmeric processing units are primarily located in Erode town, Perundurai, Bhavani, and Gobi areas. Erode turmeric fetches high curcumin content and high medicinal value, to sustain this local variety concerted efforts from government to promote curcumin based turmeric products will improve the quality of human life with longevity.

Turmeric, an earthy, bitter, peppery, and mustardy spice, is used in various products for its flavor and color. Turmeric plays a crucial role in Ayurvedic medicine, commonly utilized as an antiseptic in ointments and lotions for treating wounds and skin infections (Ahmed, 2020). In the food industry, it serves as a natural coloring agent in various products such as dairy items, sauces, ketchups, biscuits, and cakes (Sezgin, 2017). Additionally, turmeric is incorporated into cosmetics like sunscreen, fairness creams, and lotions, owing to its antioxidant properties. It is also employed as a natural dye for fabrics (Rahman, 2022), with its value-added products classified into primary products and secondary or derived products.

The global demand for turmeric has risen significantly with the discovery of its therapeutic and lifesaving properties (Tania, 2021). Turmeric stands out as the primary spice with the highest number of patented products. Another factor driving its demand is its growing use as a natural food colorant, especially as synthetic colors are increasingly being rejected in many countries (Vijayan, 2015). Erode district, one of Tamil Nadu's industrialized districts, is home to 20.60% of registered Small-Scale Industries (SSI) units, primarily engaged in turmeric processing. This

sector offers large-scale employment opportunities at low capital costs, a wide entrepreneurial base, and easy dispersion in rural and backward areas.

In recent times, there has been a notable decline in both the production and cultivation area of turmeric in the Erode district (Rajamani, 2008). To address this issue, it is imperative that turmeric growers are incentivized to explore value addition in rhizomes. By processing value-added products, not only will turmeric growers benefit from increased revenue, but processors will also see a boost in profits.

Although farmers recognize turmeric as a valuable crop, its primary use is in post-processing. This limits their marketing opportunities and prevents them from maximizing their profits, as turmeric is not typically processed into high-end products. As, farmers are unable to fully capitalize on their hard work and are often forced to sell their produce at lower prices or even leave it unharvested in the fields. Many farmers only harvest enough turmeric to meet their household needs and local consumer demand, leading to a lack of commercial production of processed turmeric goods (Booker, 2016). Some turmeric growers are even compelled to switch to other crops that can be sold fresh. In order for turmeric to reach its full commercial potential, the development of appropriate marketing channels and processing facilities is essential (Serpa Guerra, 2020). This will enable farmers to access wider markets and increase the value of their turmeric products. Ultimately, establishing the right marketing strategies and infrastructure is crucial for the commercial success of the turmeric industry.

2. METHODOLOGY

Erode plays a major role in turmeric-based industry, it's also known for Turmeric city. A detailed, comprehensive study approach was utilized to cater to the needs of turmeric-based processed industries in Erode district. Primary data was collected using systematic interview schedule, about 20 small scale turmeric processing enterprises were selected randomly through convenient sampling. Secondary data also used, has been collected from district industrial center at Erode. Data were collected tabulated, processed and subjected to statistical analysis. In this study, simple percentage analysis, SWOT analysis and Garrett's ranking technique were used to assess the turmeric processors in the Erode district. SWOT analysis of turmeric processing units effectively finds the strengths and Weaknesses also signify adverse effects that may have an impact on the service quality or added value of the product, Opportunities are resources that an industry can make use of to its benefit (Bennis B, 2023). Furthermore, all unsuitable outside occurrences that have the potential to damage the ecosystem are threats.

3. SIMPLE PERCENTAGE ANALYSIS

A percentage is a figure or ratio expressed as a fraction of 100. To find the percent of a number, you divide that number by the total and then multiply by 100 (Heiman, 1992). Thus, a percentage represents a portion out of every hundred. The term "per cent" translates to "per 100" and is symbolized by "%". To calculate the percentage, divide the given value by the total and multiply the result by 100. This study utilizes percentage analysis to evaluate the basic industrial profile of micro food processing units in the Erode district.

Percentage formula = (Value/Total value) × 100

4. GARRETT'S RANKING TECHNIQUE

The processors were asked to rank their firm level issues in marketing of turmeric products. In Garrett's ranking technique, these ranks were converted into per cent position by using the formula (V. Shanjeevika, 2022)

$$\text{Percent position} = 100 \times \frac{(Rij - 0.5)}{Nj}$$

Where,

Rij = Ranking given to the ith attribute by the jth individual

Nj = Number of attributes ranked by the jth individual.

Using Garrett's table, the estimated percentage positions were translated into scores. For each factor, the scores from various respondents were totaled, and the mean values were calculated. These mean values were then arranged in descending order, with the attribute having the highest mean value being considered the most significant, followed by the others in that sequence. (Sathya, 2022).

5. RESULT AND DISCUSSION

5.1. DEMOGRAPHIC PROFILE OF THE TURMERIC PROCESSING UNITS IN ERODE DISTRICT

The fundamental demographic characteristics of the turmeric processing units are outlined in Table 1.

Table 1

Table 1 Demographic Profile of the Processing Units

Particulars	No. of units Responded
Age	
Below 35	2
	-10
36-50	8
	-40
Above 50	10
	-50
Total	20
	-100
Gender	
Male	20
	-100
Experience	
Below 10	5
	-25
Nov-20	5
	-25
21-30	6
	-30
Above 30	4
	-20
Total	20
	-100

Family Structure	
Nuclear	13
	-65
Joint	7
	-35
Total	20
	-100

Source Figures in Parentheses Indicate Percentage to Total

The findings indicate that a significant portion of the respondents, 50%, were above the age of 50, with 40% falling in the age group of 36 to 50. Only 10% of respondents were below the age of 35, suggesting that the majority of participants were in the above 50 age group. Additionally, all processing units were owned by males. In terms of experience, 30% of unit owners had 21 to 30 years of experience, followed by 25% with below 10 years and 11-20 years of experience, and 20% with 30 years of experience. The type of family, whether nuclear or joint, was found to influence the level of family labor contribution in processing. The results revealed that 65% of respondents belonged to nuclear families, indicating a predominant family type among participants.

5.2. OWNERSHIP PATTERN AND WORK FORCE OF THE TURMERIC PROCESSING UNITS IN ERODE DISTRICT

The ownership pattern and Workforce of turmeric processing units in Erode district are outlined in Table 2.

Table 2

Table 2 Ownership Pattern Workforce of the Turmeric Processing Units in Erode

Particulars	No. of units Responded
Ownership Pattern	
Proprietorship	20
	-100
Land Ownership	
Own Land	20
	-100
Workforce: Total No. of Labours	
Up to 10 labours	11
	-55
11-20 labours	7
	-35
Above 20labours	2
	-10
Total	20
	-100
Source of Procurement	
Regulated Market	12
	-60
Cooperative Society	2

	-10
Farmers	1
	-5
Traders	5
	-25
Total	20
	-100

Source Figures in Parentheses Indicate Percentage to Total

The findings indicate that all of the turmeric processing units surveyed were operated as sole proprietorship businesses. The majority of unit owners expressed a preference for maintaining complete control over their operations, citing the benefits of effective decision-making processes within their businesses. It was observed that all turmeric processing units had established their processing facilities on their own land. The workforce was characterized by the number of laborers involved in the production of finished goods and products. The data revealed that 55% of processing industries employed fewer than 10 workers, while 35% had between 11-20 laborers, and 10% had more than 20 laborers. This underscores the significant labor requirements of turmeric processing units.

The source of procurement plays a crucial role in the availability of raw materials and the location of processing units. The results indicated that 60% of turmeric processing units sourced their turmeric finger and bulb from regulated markets in Perundurai, Nasiyanur, and Thindal in Erode district. Additionally, 25% of units procured raw materials from traders, 10% from cooperative markets in Erode, and only 5% directly from farmers. Procurement prices varied based on factors such as moisture content, color, size, and quality of the turmeric finger and bulb. Furthermore, the data revealed that 95% of unit owners funded their businesses through personal investment, while only 5% received financial support from banks. This highlights the self-reliant nature of the majority of turmeric processing units in Erode.

6. MECHANIZATION FOR TURMERIC PROCESSING INDUSTRIES IN ERODE DISTRICT

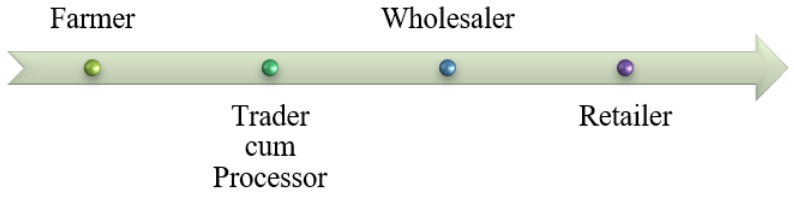
In Erode district, fresh turmeric is processed into dry turmeric through a curing method. This process involves boiling the fresh rhizomes in water followed by sun drying. Traditionally, the cleaned rhizomes are boiled in water just enough to submerge them. The boiling is halted when froth forms and white fumes with a distinctive odor are released. In the improved scientific curing method, cleaned turmeric fingers are placed in a perforated trough, typically 0.9 m x 0.5 m x 0.4 m in size, made of GI or MS sheet with an extended handle (Kandiannan, 2008). This trough is immersed in a pan, and 100 liters of water are added to submerge the turmeric. The turmeric is then dried either by sun exposure or using artificial methods, such as crossflow hot air drying at a maximum temperature of 60°C, which also yields a satisfactory product. Turmeric is either polished manually or using power operated drums. There are different ambient grinding mills and methods available for this process, such as hammer mill, attrition mill and pin mill. In India, traditionally, plate mills and hammer mills are used for turmeric grinding.

7. MARKETING OF TURMERIC AND THEIR PRODUCTS IN ERODE DISTRICT

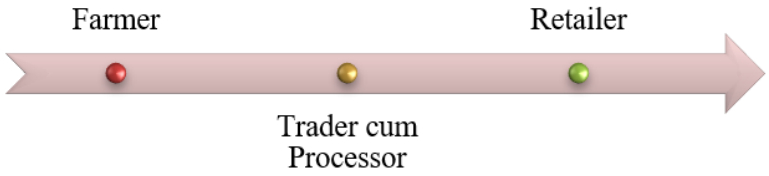
Raw material procured from Regulated market, Cooperative marketing society and FPO. In FPO the processors could able to procured the graded produce. About 40% of the processing unit owners were marketed to retailers followed by wholesalers. This is revealed that majority of the turmeric processing unit owners were sold their product directly to the retail shops and followed by wholesaler and traders in around the districts (Nagula, 2023). In some cases, pre-processed raw turmeric finger and bulb also marketed through traders from Erode and other districts and states.

Processors procured the raw material from farmers through commission agents, through regulated market and through cooperative marketing society. There are two cooperative marketing societies and one FPO through which members sold their turmeric fingers. Majority of the processors in Erode were involved in production of turmeric powder. The turmeric powder was packed and sold through wholesaler to the retailer and directly to the retailer. The marketing channel for the turmeric powder is presented below.

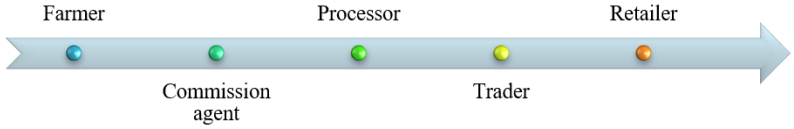
Channel 1



Channel 2



Channel 3



8. MANUFACTURING PROCESS AND TECHNOLOGY OF TURMERIC PROCESSING IN ERODE DISTRICT

- **Product Range:** Turmeric is rich in bioactive compounds with potent medicinal properties. Value-added products refer to raw agricultural goods that have been enhanced or modified to increase their market value and extend their shelf life. According to Shams, there is a wide range of value-added products that can be created using turmeric, which not only have significant commercial appeal but also offer various health benefits. Examples include Turmeric Oleoresin/Extract, Haldi Drops, Curcumin Powder, Turmeric Milk, and more. These products have gained widespread acceptance in the market due to their unique properties and potential health advantages. Incorporating

turmeric into value-added products can be a lucrative and beneficial venture for businesses looking to capitalize on the growing demand for natural and health-promoting products.

Turmeric rhizomes are harvested and undergo a thorough cleaning process to remove stones, mud and other debris. The next step involves curing the rhizomes after they are dried and polished to enhance their quality and command a higher price in the market.

9. PROCESS OF TURMERIC POWDER

The manufacturing process of turmeric powder involves grinding, sieving, and packing the cured rhizomes, as shown in the figure 1.

- **Grinding:** Polished turmeric fingers undergo grinding, a common operation used to produce turmeric powder for consumption and sale. The primary goal of spice grinding is to achieve smaller particle sizes while maintaining product quality in terms of flavor and color. Various grinding mills and methods are available, including hammer mills, attrition mills, and pin mills. In India, plate mills and hammer mills are traditionally used for grinding turmeric.
- **Sieving:** After grinding, the turmeric powder is passed through screens to sort the particles by size, with larger particles being re-ground if necessary. Screens with mesh sizes ranging from 60 to 80 are typically used for this purpose.
- **Packing:** The turmeric powder is then packed using materials that protect it from common deteriorating factors such as moisture absorption, loss of aroma or flavor, discoloration, insect infestation, and microbial contamination. The volatile oils in turmeric may react with the inner layer of the packaging material, potentially resulting in a greasy and messy package with smudged printing.

Figure 1

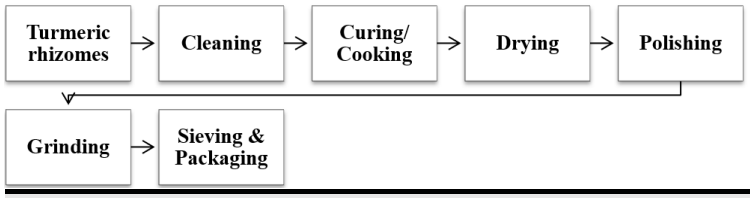


Figure 1 Manufacturing Process of Turmeric Powder

From Firm to Market level issues of turmeric processing micro enterprises in Erode district

Table 3

Table 3 Market Level Issues of Turmeric Processing Micro Enterprises in Erode District

S. No.	Constraints in Marketing	Mean Score	Rank
1	Lack of Cold Storage	**45.6**	**I**
2	Lack of market for Organic certified products	**32.36**	**II**
3	Labour Scarcity	**26.9**	**III**
4	Lack of Value addition technology	**22.42**	**IV**
5	Loan facility to machinery	**20.15**	**V**

One of the primary obstacles faced by farmers as well as processors showed in table 3, the lack of cold storage facilities, which hinders their ability to preserve and store their produce effectively. Additionally, there is a limited market for organic certified products, making it difficult for farmers to sell their goods at a premium price. Labour scarcity is another pressing issue in the industry, as finding skilled workers to assist with farming activities can be a challenge. Furthermore, the lack of value addition technology hampers Processors' ability to add value to their products and increase their market value (Ugonna, 2015). Lastly, access to loan facilities for machinery is crucial for processor to invest in the necessary equipment to improve their productivity and efficiency. Addressing these challenges is essential for the growth and sustainability of the turmeric based agricultural sector in Erode district.

10. SWOT ANALYSIS FOR TURMERIC PROCESSING UNITS IN ERODE DISTRICT

The strategic planning method was utilized to assess the strengths, weaknesses, opportunities, and challenges associated with turmeric processing industries in Erode district.

- **Strengths:** Competitive advantage lies in the availability of high-quality raw materials, particularly varieties with high curcumin content (Mangathayaru, 2013). Robust infrastructure for processing guarantees efficient production, further solidifying position in the turmeric market.
- **Weaknesses:** The absence of cold storage facilities is impeding the capacity to efficiently store raw materials. The exorbitant cost of raw materials is negatively impacting the turmeric financial performance. Inadequate marketing promotion strategies, including branding efforts, were constraining our market penetration (Rahana Ibrahim, 2014). Additionally, limited awareness of Government programs is hindering the ability to access potential resources.
- **Opportunities:** The medicinal and industrial applications of turmeric product offer substantial opportunities for growth. By expanding into both national and international markets, we can drive revenue growth and capitalize on the potential for value addition to turmeric products (Moritz, 2020), thereby enhancing their market appeal.
- **Threats:** Other states that are able to produce goods at a lower cost than Tamil Nadu present a significant challenge to turmeric competitiveness in the market.

11. CONCLUSION

Turmeric has great commercial and health benefits as a value-added product. To increase its market value, a value addition center needs to be installed at Erode with technical guidance and support. Currently, curcumin content does not affect pricing, but it should be encouraged to fetch premium prices for high-quality turmeric (Booker, 2016). Adequate storage facilities are needed to maintain reasonable prices and retain Erode as a major hub. Organic turmeric marketing and subsidized machinery for processing should also be promoted (Vidanapathirana, 2014). Establishing quality testing units and implementing cluster-based

interventions (Shree, 2022) for turmeric cultivation can improve the economic status of Erode district and generate revenue for growers and processors.

CONFLICT OF INTERESTS

None.

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