



## Research Article

# VALUE CHAIN ANALYSIS OF TAPIOCA IN SALEM DISTRICT OF TAMIL NADU

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**Abstract:** It is important to assess the whole range of operations needed to move fresh tubers through various phases of production, processing, and marketing until it reaches the consumer in order to avoid post-harvest losses and promote the development of tapioca. This study investigates the problems faced by various actors in tapioca value chain such as farmers, commission agents and processors. In this study, 120 responses were taken from the farmers, 10 responses from commission agents and 5 responses from Sago industries of Salem district in Tamil Nadu as it is one of the major tapioca producing areas. The analysis methods in this study included percentage analysis and Garrett Ranking. The study found that price fluctuation was the major constraint faced by farmers in tapioca farming. It also found that the constraint faced by commission agent was shortage of labor availability and higher transportation cost was the major constraint faced by sago industries. Furthermore, this study made some suggestions to overcome these constraints.

**Keywords:** Tapioca value chain, Constraints, Price fluctuation, Labor unavailability

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## Introduction

Tapioca, commonly known as cassava (*Manihot esculenta*), is a good thickening agent in both sweet and savory meals due to its high carbohydrate content, neutral flavor, and great gelling activity. In Tamil Nadu, tapioca is eaten raw after removing the skins/outer layer or boiled for a variety of cuisines and snacks. It is also treated to produce starch, which is used to make tapioca pearls (sago), wafers, and other products. Tapioca peels and leftovers, known as "Thippi," are used as cow feed and as a raw ingredient in the production of cattle feed. Tamil Nadu is a significant tapioca planter in the country, with considerable impact on the agricultural sector, particularly in the western portion of the state, where this crop is primarily grown. Tapioca is grown on over 91.51 thousand hectares in Tamil Nadu, with a yield of about 38 lakh tonnes [1].

The value chain encompasses all activities from seed selection to delivery of the final product to the consumer. Value chain generally includes input suppliers, producers, traders, wholesalers, retailers, processors, export/import distributors. An effective value chain management system encourages farmers to produce more and communicates changing consumer needs. It allows farmers to plan production based on market pressures. To create an integrated value chain, an efficient marketing system requires vertical and horizontal integration of production, post-harvest management, storage, processing, and distribution [2-5].

## Objectives of the study

To examine the problems faced by growers and intermediaries in the value chain of tapioca.

## Material and Methods

### Selection of Study Area

The research was carried out in the Salem district. The reason for choosing Salem as the study area was because it was one of Tamil Nadu's key tapioca producing areas. The district has produced 412 thousand metric tonnes of tapioca in 2020-2021, with a total area under tapioca production of 9.9 thousand hectares [6-10].

## Selection of Sample Respondents

Among the twenty blocks, Thalaivasal, Attur and Gangavalli blocks in Salem district with the maximum area under tapioca cultivation were chosen in the second stage of sampling. In the third stage, data was collected from five villages from each of the selected blocks. For the study, eight farmers were chosen at random from each hamlet. The intermediaries, which included commission agents and processors, were chosen at a rate of 10 and 5 respectively. As a result, the study's overall sample included one hundred and twenty farmers and fifteen intermediaries [11-15].

## Study period

The study's reference year is 2022. During the months of May and June of 2022, primary data was collected from a random sample of respondents.

## Data Collection and Analysis

### Percentage Analysis

Age, family size, farm size, experience in tapioca cultivation, landholding pattern, and other demographic and socio-economic factors of the sample farmers were evaluated using percentages and averages.

### Garrett Ranking Technique

The technique created by Garrett (1966) [3] was used to analyze the primary challenges faced by tapioca growers and intermediaries in the value chain of tapioca. Garrett's method involved asking the sample respondents to rank the difficulties, which were then transformed into percent positions using a formula.

$$\text{Percent position} = (100 \times (R_{ij} - 0.5)) / N_j$$

Where,

$R_{ij}$  denotes the Rank given by the  $j^{\text{th}}$  individual to the  $i^{\text{th}}$  problem

$N_j$  denotes Number of problems ranked by the  $j^{\text{th}}$  individual.

### Analysis and findings

The demographic details of the respondents who were farmers [Table-1]. According to the survey, there were more male respondents (75 percent) than female respondents in tapioca cultivation. According to the report, the bulk of sample respondents are older over 50 (44.2 percent), followed by those between 41 and 50 (42.4 percent). In terms of marital status, there were more married respondents (96.7 percent) than single people. Similar to family size, a medium size family has more members (44.2 percent) than a small or large family. Furthermore, it is noted that 49.2 percent of the sample farmers cultivate tapioca in less than 1 ha, and the majority of tapioca farmers (43.3 percent) have 20 to 30 years of expertise in the crop.

Table-1 Demographic details of sample respondents (Tapioca farmers)

| Gender                         | No of respondents (n=120) | Percentage (100%) |
|--------------------------------|---------------------------|-------------------|
| Male                           | 90                        | 75                |
| Female                         | 30                        | 25                |
| Age (Years)                    |                           |                   |
| <30 years                      | 3                         | 2.5               |
| 31-40                          | 13                        | 10.9              |
| 41-50                          | 51                        | 42.4              |
| >50 years                      | 53                        | 44.2              |
| Marital status                 |                           |                   |
| Single                         | 4                         | 3.3               |
| Married                        | 116                       | 96.7              |
| Educational qualification      |                           |                   |
| Illiterate                     | 20                        | 16.7              |
| Primary                        | 30                        | 25                |
| Secondary                      | 33                        | 27.5              |
| Higher Secondary               | 25                        | 20.8              |
| Graduate                       | 12                        | 10                |
| Family size                    |                           |                   |
| Small(<4)                      | 37                        | 30.8              |
| Medium (4 and 5)               | 53                        | 44.2              |
| Big(>5)                        | 30                        | 25                |
| Size of Farm Holding           |                           |                   |
| Marginal farmer(<1)            | 5                         | 4.2               |
| Small farmer(1-2)              | 49                        | 40.8              |
| Medium farmer(2-4)             | 48                        | 40                |
| Big farmer(>5)                 | 18                        | 15                |
| Experience in tapioca farming  |                           |                   |
| <10 years                      | 3                         | 2.5               |
| 10-20 years                    | 17                        | 14.2              |
| 20-30 years                    | 52                        | 43.3              |
| >30 years                      | 48                        | 40                |
| Area under tapioca cultivation |                           |                   |
| <1 ha                          | 59                        | 49.2              |
| 1-2 ha                         | 43                        | 35.8              |
| 2-4 ha                         | 17                        | 14.2              |
| >5 ha                          | 1                         | 0.8               |

### Constraints faced by farmers

From the [Table-2], it is observed that, the biggest obstacle to farmers' capacity to grow tapioca was price volatility, with a Garrett score of 64.41, followed by disease outbreak, monsoon failure, tuber loss after harvest, a lack of available labor, and high input costs.

Table-2 Constraints faced by farmers in tapioca cultivation

| SN | Problems faced by tapioca farmers | Garrett score | Rank |
|----|-----------------------------------|---------------|------|
| 1  | Price fluctuation                 | 64.41         | I    |
| 2  | Disease attack                    | 55.45         | II   |
| 3  | Monsoon failure                   | 53.84         | III  |
| 4  | Wastage of tubers during harvest  | 48.56         | IV   |
| 5  | Shortage of labor availability    | 47.16         | V    |
| 6  | High input cost                   | 29.27         | I    |

### Demographic details of intermediaries

the demographic details of the intermediaries who were Commission Agents [Table-3]. According to the survey, there were only male respondents (100 percent), no female respondent as tapioca commission agent. According to the report, the bulk of sample respondents are between 41-50 years (40 percent), followed by those >50 years (30 percent). In terms of marital status, there were more married respondents (90 percent) than single people (10 percent).

Similar to family size, more members have medium size family (50 percent) than a small or large family. Furthermore, it is noted that the majority of tapioca commission agents (40 percent) have 20 to 30 years of expertise in the crop.

Table-3 Demographic details of Commission Agents

| Gender                         | No of respondents (n=10) | Percentage (100%) |
|--------------------------------|--------------------------|-------------------|
| Male                           | 10                       | 100               |
| Female                         | -                        | -                 |
| Age (Years)                    |                          |                   |
| <30 years                      | 1                        | 10                |
| 31-40                          | 2                        | 20                |
| 41-50                          | 4                        | 40                |
| >50 years                      | 3                        | 30                |
| Marital status                 |                          |                   |
| Single                         | 1                        | 10                |
| Married                        | 9                        | 90                |
| Educational qualification      |                          |                   |
| Illiterate                     | 2                        | 20                |
| Primary                        | 3                        | 30                |
| Secondary                      | 1                        | 10                |
| Higher Secondary               | 3                        | 30                |
| Graduate                       | 2                        | 20                |
| Family size                    |                          |                   |
| Small(<4)                      | 2                        | 20                |
| Medium (4 and 5)               | 5                        | 50                |
| Big(>5)                        | 3                        | 30                |
| Experience in tapioca business |                          |                   |
| <10 years                      | 1                        | 10                |
| 10-20 years                    | 3                        | 30                |
| 20-30 years                    | 4                        | 40                |
| >30 years                      | 2                        | 20                |

### Constraints faced by Intermediaries

The study found that, with a Garrett score of 67.05, the lack of readily available labor was the main barrier preventing commission agents from successfully harvesting and marketing tapioca. This was followed by high transportation and handling costs, late payments, inadequate storage facilities, and a lack of high-quality tubers.

Table-4 Constraints faced by Intermediaries in tapioca harvesting and marketing

| SN | Problems faced by Commission Agents | Garrett score | Rank |
|----|-------------------------------------|---------------|------|
| 1  | Shortage of labor availability      | 67.05         | I    |
| 2  | High transportation cost            | 65.92         | II   |
| 3  | High handling cost                  | 48.15         | III  |
| 4  | Late payment                        | 48.90         | IV   |
| 5  | Poor storage facility               | 32.13         | V    |
| 6  | lack of quality tubers              | 26.91         | I    |

Table 5 Demographic details of Tapioca processors

| Gender                      | No of respondents (n=5) | Percentage (100%) |
|-----------------------------|-------------------------|-------------------|
| Male                        | 5                       | 100               |
| Female                      | -                       | -                 |
| Age (Years)                 |                         |                   |
| <30 years                   | -                       | -                 |
| 31-40                       | 1                       | 20                |
| 41-50                       | 2                       | 40                |
| >50 years                   | 2                       | 40                |
| Marital status              |                         |                   |
| Single                      | -                       | -                 |
| Married                     | 5                       | 100               |
| Educational qualification   |                         |                   |
| Illiterate                  | -                       | -                 |
| Primary                     | -                       | -                 |
| Secondary                   | -                       | -                 |
| Higher Secondary            | 2                       | 40                |
| Graduate                    | 3                       | 60                |
| Family size                 |                         |                   |
| Small(<4)                   | 1                       | 20                |
| Medium (4 and 5)            | 2                       | 40                |
| Big(>5)                     | 2                       | 40                |
| Experience in sago business |                         |                   |
| <10 years                   | 1                       | 20                |
| 10-20 years                 | 1                       | 20                |
| 20-30 years                 | 1                       | 20                |
| >30 years                   | 2                       | 40                |

### Demographic details of intermediaries

[-] shown the demographic details of the tapioca processors, who were having sago industries. According to the survey, there were only male respondents (100 percent). According to the report, the bulk of sample respondents are between 41-50 (40 percent) and >50 years (40 percent). In terms of marital status, there were all married respondents (100 percent) and no single people. Furthermore, it is noted that the majority of tapioca processors (40 percent) have 20 to 30 years of expertise in sago production.

### Constraints faced by Tapioca processors

From the [Table-6], it is found that the main barrier to tapioca processing and marketing was high transportation costs, with a Garrett score of 71.4, followed by labor shortages, electricity shortages, the lack of year-round access to tubers for processing, and the lack of tuber storage facilities.

Table-6 Constraints faced by processors in tapioca processing

| Problems faced by Tapioca processors                     | Garrett score | Rank |
|----------------------------------------------------------|---------------|------|
| High transportation cost                                 | 71.4          | I    |
| Scarcity of Labor                                        | 66.4          | II   |
| Electricity power                                        | 51.0          | III  |
| Non availability of tubers round the year for processing | 38.2          | IV   |
| Non-availability of storage facility for tubers          | 27.0          | V    |

### Suggestions

In Tamil Nadu, tuber pricing is set by sago industrialists based on the starch content. This practice is beneficial to processors but not to farmers. On the basis of the cost of starch and sago, the price of starch points was likewise set in this instance. Farmers will not receive a lucrative price if the starch content is low. In order to properly price raw tapioca tubers, the government must adopt an appropriate price policy. To safeguard the long-term interests of the farmers, a specific gravity machine-based minimum support price for tapioca starch units must be announced.

Nowadays, the primary reason for transportation issues is the increase in fuel prices. The cost of transportation would go up, and business earnings would go down as a result of fuel price hike. Therefore, depending on its availability, the government could either consider lowering the price of fuel or suggesting some alternate fuels.

### Conclusion

According to the findings of this study, it is concluded that the producers in the modern tapioca market are constrained by price volatility because there isn't even a minimum support price for raw tubers. Additionally, commission agents are constrained by a lack of labor availability since tapioca tuber harvesting requires more laborers, and tapioca processors, which address Sago industries, are constrained by transportation issues as a result of the recent increase in fuel prices.

**Application of research:** Used to identify the constraints faced by Farmers, Commission Agents and Sago Processors in Tapioca value chain.

**Research Category:** Agricultural Rural Management

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**Study area / Sample Collection:** Salem/135

**Cultivar / Variety / Breed name:** Cassava (*Manihot esculenta*)

**Conflict of Interest:** None declared

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.

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