Original Research Article

MARKET CONCENTRATION OF BRANDED RICE IN KERALA

ABSTRACT

Abstract: In Kerala rice is a staple diet. As per the information from Kalady Rice Millers' Consortium, 40 per cent of the consumers in Kerala prefer branded rice, and out of this Kerala absorbs only 16 per cent, the rest of the branded rice is from outside states like Andhra Pradesh, Tamil Nadu and West Bengal. This study investigates the market concentration of Kerala's branded rice market, focusing on the dominance of a few key players and its market share, pricing power, and concentration. The analysis employs four-firm concentration ratio, the Herfindahl-Hirschman Index (HHI), Gini coefficient and the Lorenz curve to reveal an oligopolistic structure, where a small number of firms control a substantial portion of the market. Major players like Pavizham, Keerthi Nirmal, Periyar, Kottaram, and Jayabharath, alongside the Kalady Rice Miller's Consortium, play a crucial role in shaping the branded rice market in Kerala. The study involved a survey conducted between November 2023 and June 2024, with a random sample of 10 non-exporters, 5 exporters, and one co-operative rice mill, selected from the 46 branded rice manufacturers in the state, predominantly from Ernakulam and Palakkad districts. The findings of the study highlighted that the branded rice market in Kerala had an oligopolistic behaviour. This research fills a gap in understanding the distribution of market power in Kerala's rice industry and offers suggestions for fostering greater competition and inclusivity in the market.

Keywords: Market concentration, concentration ratio, Herfindahl Hirschman Index, Gini coefficient, Lorenz curve, rice brands

1. INTRODUCTION

The rice market in Kerala has undergone significant changes over the years, with branded rice increasingly gaining prominence among consumers. The branded rice can be defined as the brands which have been registered under the Trade Marks (Amendment) Act, 2010. Branded rice market is defined as the market for branded rice (excluding medicinal and specialty rice). The state, traditionally reliant on paddy cultivation and local rice varieties, has seen a rise in demand for branded rice due to factors such as shifting consumer preferences, quality assurance, and improved distribution networks. As per the information from Kalady Rice Millers' Consortium, 40 per cent of the consumers in Kerala prefer branded rice and out of this Kerala absorbs 16 per cent, the rest of the branded rice is from outside states. Despite the deficiency in rice production, Kerala exported 0.50 per cent of rice during the period 2018-19 (Export Import Bank of India, 2023). Understanding the dynamics of market concentration in this sector is crucial, as it reveals the degree to which a few key players dominate the market, potentially impacting competition and their market share.

Several studies have examined the consumer dynamics and branding strategies in the rice market in Kerala, but few have delved into the structural analysis of market concentration. For instance, Thomas and George (2021) investigated the factors driving consumer preferences for branded rice, highlighting price sensitivity, quality perception, and marketing strategies. While this research provides valuable insights into consumer behavior, it overlooks the role of market concentration in shaping pricing power and competition dynamics.

In another study, Nair et al. (2019) focused on the supply chain efficiencies in the rice industry, examining the logistical challenges faced by producers and distributors. However, the study did not address how market concentration affects the distribution of market power among rice producers, particularly between large branded firms and smaller regional players. This leaves a gap in understanding the influence of market concentration on competitive balance.

Similarly, Rao and Menon (2018) explored the branding strategies of leading rice manufacturers in Kerala, assessing the impact of packaging, advertising, and consumer trust on brand loyalty. While comprehensive in its examination of branding techniques, the study did not consider how market

concentration might limit the entry of new players or how it impacts small and medium enterprises (SMEs) operating in the branded rice market.

Additionally, while many studies utilize the Concentration Ratio (CR4) and Herfindahl-Hirschman Index (HHI) for general industry assessments (e.g., Patel & Singh, 2020), their application to the rice market in Kerala remains limited. Further, studies using the Gini coefficient and Lorenz curve to analyze income or market share distribution are scarce, particularly in agribusiness contexts like branded rice. These tools are crucial for understanding inequality in market control, yet remain underutilized in previous research.

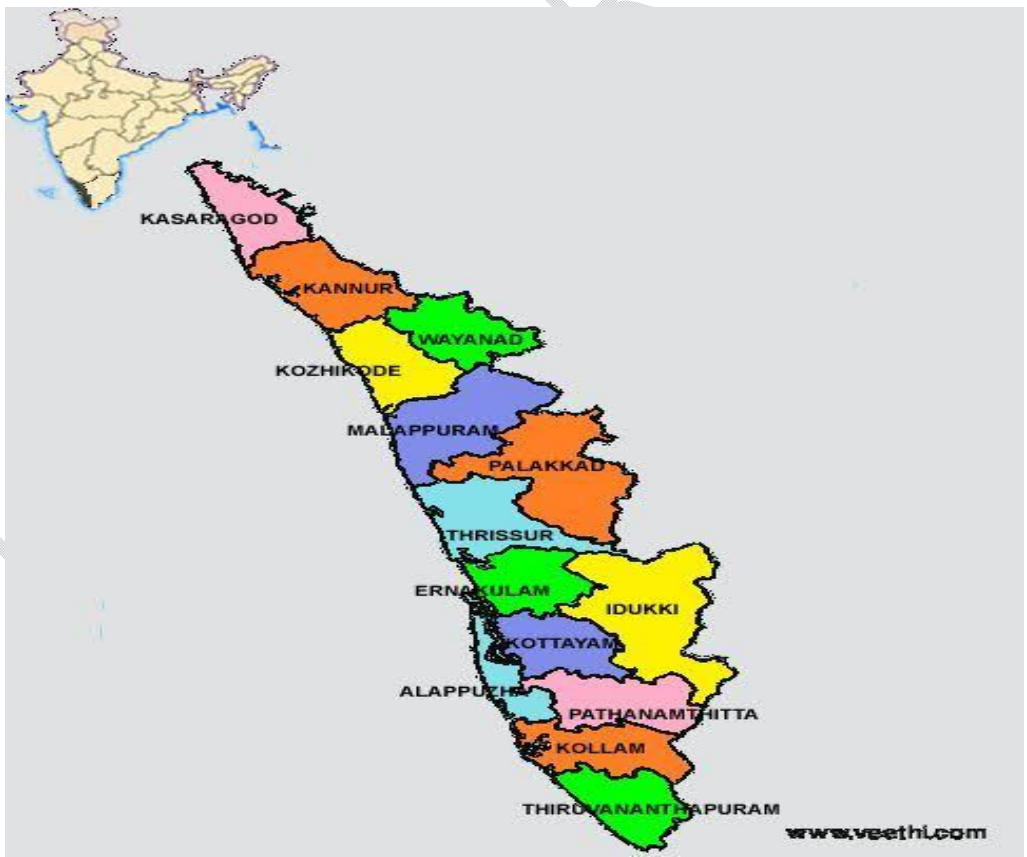
As a result, there is a lack of comprehensive studies that integrate these economic tools to assess market concentration in Kerala's branded rice sector. This study aims to fill this gap by conducting a detailed analysis using CR4, HHI, Gini coefficient, and Lorenz curve to provide a clearer picture of market dominance and its implications for competition, pricing, and market accessibility.

This study explores the market concentration of branded rice in Kerala through the manufacturers of branded rice and identifying the leading players. By analyzing the concentration ratio and Herfindahl-Hirschman Index (HHI), the study provides insights into the competitive landscape, offering a clearer picture of whether the market is dominated by a few major brands or remains competitive with numerous smaller players. The findings will help stakeholders understand the implications of market concentration on the rice supply chain, consumer behavior, and overall market performance in Kerala.

2. MATERIALS AND METHODOLOGY

2.1. Location of the study

The highest number of rice mills in Kerala was from Ernakulam district followed by Palakkad district. Both of the districts were purposively selected for the study.



2.2 Period of study

The survey was conducted during the period of November, 2023 to June, 2024.

2.3 Sources of data

Both primary and secondary data were used for the study regarding the sale of branded rice done by the rice manufacturers. The data was collection was done by using a pre-tested structured questionnaire.

2.4. Sample selection

There are 408 rice manufacturers in Kerala (DIC, 2021), and out of this 46 are branded rice manufacturers including one co-operative rice mill. 10 non-exporters and 5 exporters were randomly selected in proportion to the number of private branded rice manufacturers from Ernakulum and Palakkad districts. One co-operative rice mill from Palakkad district also selected for the study. The survey was conducted during the period of November, 2023 to June, 2024. Random sampling was used for the sample selection. The rice brands within Kerala were only selected for the study.

Table 1 List of rice manufacturers of branded rice in Kerala

Sl.no	Brands	Type	District
1	Pavizham, Orma	Exporters	Ernakulam
2	Keerthi Nirmal		
3	Nirapara		
4	Periyar		
5	Mayoori, Mayil		
6	SADYA		
7	Aavani	Non-exporters	
8	Harishree		
9	Thripthi rice		
10	Nirakathir		
11	Matha Brand		
12	Ponnari		
13	Ajwa gold Brand		
14	Thiruvonam		
15	Land farm		
16	Kitchen special		
17	Ruchi rice		
18	Family rice		
19	Nellad		
20	Onam		
21	Mother's		
22	SATHYAM		
23	Peter's		
24	Polima		
25	Kaveri		
26	Jaihind		
27	Jayabharath	Exporters	Palakkad
28	Double Horse		
29	Kottaram		
30	Nellari, Nenmani		
31	K P M	Non-exporters	
32	Annam		
33	Gemini		
34	Kissan		

35	Jyothi		
36	Grihalakshmi		
37	AASTHA		
38	SS PLATINUM		
39	Maharishi		
40	MARRUTHI		
41	SNEHAM		
42	Rabbit mark		
43	PADDICO	Co-operative rice mill	
44	Black horse	Non-exporters	Malappuram
45	Rani Rice		Kottayam
46	ATHISAYA FOOD PRODUCTS		Thrissur

(Source: Directorate of Industries & Commerce, 2021)

3. DATA ANALYSIS METHODS

Market concentration refers to the extent to which a small number of firms dominate total sales, production, or capacity in a particular market. it is typically used to assess the competitive dynamics of an industry and the potential for monopolistic or oligopolistic behaviour (Bain,1956; Schmalensee, 1989). The concentration ratio is often used to measure this dominance, focusing on the market share of the top firms, usually to four of them. One of the other ways to calculate the market concentration is with the Herfindahl-Hirschman Index (HHI), which involves adding up the square of each firm's market share in the industry. For a detailed analysis the market concentration by using Gini coefficient were also calculated. The graphical representation of the market concentration was done by using Lorenz curve.

3.1 CR4 (Concentration Ratio for Top 4 Firms):

CR4 is a measure used to determine the market concentration by looking at the combined market share of the top four firms in an industry. It shows how much control these leading firms have over the market. If the CR4 is high, it means the industry is dominated by a few large firms, indicating less competition. If the CR4 is low, it suggests that the market is more competitive, with many firms holding small shares. CR4 is often used to assess the level of monopoly or oligopoly in a market.

$$CR_4 = S_1 + S_2 + S_3 + S_4$$

Where, S_1, S_2, S_3, S_4 are the market shares (as percentages) of the top 4 firms.
CR4 ranges from 0 to 100. A high CR4 (closer to 100) indicates that the market is dominated by a few firms, while a low CR4 (closer to 0) indicates a competitive market.

3.2 HHI (Herfindahl-Hirschman Index):

The Herfindahl-Hirschman Index (HHI) is another way to measure market concentration. It is calculated by squaring the market share of each firm in the industry and then adding them together. An HHI value closer to 0.15 indicates an unconcentrated market many small firms while an HHI value closer to 0.25 suggests that the market is highly concentrated, with one or a few firms dominating. It provides a more detailed view of market concentration compared to CR4 because it takes into account the market shares of all firms in the industry, not just the top four.
The formula for HHI is:

$$HHI = \sum_{i=1}^{N} S_i^2$$

S_i =market share of firm
N=Total number of firms in the industry

3.3 Gini Coefficient and Lorenz Curve:

The concentration ratio -the Gini coefficient and the Lorenz curve were used to measure the degree of market concentration. The Gini coefficient was calculated following:

G=1-XY
G= Gini coefficient
XY=(Proportion of rice manufacturers) X (Cumulative share of yearly sales)
The Gini coefficient lies between 0 and 1 with values closer to 0 indicating perfect equality of market participants and those closer to 1 indicating inequality among the market participants (Tiku et al., 2009).
The Lorenz curve was used to further illustrate the structure of the market. The Lorenz curve was derived in excel using the Gini values of wholesalers and retailers. A Lorenz curve closer to the line of equality indicates an equality among the market players and a Lorenz curve further from the line of perfect equality indicates inequality among the market players.

4. RESULTS AND DISCUSSION

After studying the profile of the rice manufacturers, it can be identified that majority of the private rice manufacturers are under partnership, because it allows for shared investment, risk distribution and collaborative management. Among the selected rice manufacturers most of them were having milling experiences of 15 to 30 years. Majority of them having an annual turn over of less than ₹10 crores and 60 percent having milling capacity of below 100 tonnes per day.

There was only one co-operative rice brand from Kerala registered under the trademarks (amendment) act, 2010. That was "The Palakkad Jilla Nellusambhara Vipanana Samskarana Vyavasaya Sahakarana Sangam Ltd", popularly known as PADDICO. For the purpose of the study, PADDICO co-operative society was selected to represent the co-operative sector.

PADDICO established in the year 1997, with the aim of procuring and processing of paddy in the brand name of PADDICO. But started its functioning in the year 2004 due to the investment constraints. The number of members was 153 in the year 2022 and decreased to 116 in the year 2023. The milling capacity of the plant was 60 tonnes per day and had an annual turnover of ₹ 6 crores last year. The PADDICO rice was selling only through their 14 outlets.

4.1 Market concentration using sales value

Market concentration refers to the extent to which a small number of firms dominate total sales, production, or capacity in a particular market. it is typically used to assess the competitive dynamics of an industry and the potential for monopolistic or oligopolistic behaviour (Bain,1956; Schmalensee, 1989). The concentration ratio is often used to measure this dominance, focusing on the market share of the top firms, usually to four of them. One of the other ways to calculate the market concentration is with the Herfindahl-Hirschman Index (HHI), which involves adding up the square of each firm's market share in the industry. Here the total yearly sales value of all the 16 brands were collected from the rice manufacturers. Based on that the market share of all the brands were derived. For the purpose of the study, the market concentration based on the yearly sales was calculated. That was by using both CR_4 and HHI and presented in table 2.

Table 2 Market concentration based on total sales value of the brands (n=16)

Brands	Yearly sales (in million₹)	Market share (Yearly sales/Total sales)	Market share on sales value (%)
Pavizham	1872.51	0.3488	34.88
Keerthi nirmal	1707.51	0.3181	31.81
Periyar	765.20	0.1425	14.25
Kottaram	294.93	0.0549	5.49
Jayabharath	183.19	0.0341	3.41
Kaveri	51.94	0.0097	0.97
Rabbit	34.40	0.0064	0.64
Gemini	25.80	0.0048	0.48
Peters	23.39	0.0044	0.44
Polima	17.20	0.0032	0.32
Kissan	16.77	0.0031	0.31
Mothers	143.49	0.0267	2.67
Jai hind	12.38	0.0023	0.23

Annam	120.31	0.0224	2.24
PADDICO	56.08	0.0104	1.04
Harishree	43.34	0.0081	0.81
Total	5368.46	1.0000	100.00
		CR_4	**86.43%**
		HHI	**0.2125**

Source: Compiled from annual reports

CR_4	**Competition level**
0	Perfect competition
0-40	Effective competition or Monopolistic competition
40-60	Loose oligopoly or Monopolistic competition
>60	Tight oligopoly or Dominant firm with a competitive fringe

Source: Naldi and Flamini (2014)

HHI	**Competition level**
<0.15	Unconcentrated market
0.15-0.25	Moderately concentrated market
>0.25	Highly concentrated market

Source: Naldi and Flamini (2014)

It can be interpreted that the top four rice brands, including Pavizham, Keerthi nirmal, Periyar and Kottaram control 86.43 per cent of the market. It indicates that the top four firms control a significant portion of the branded rice market, which means a high level of market concentration and potential oligopolistic behaviour.

As HHI includes all the rice manufacturers in the selected sample, it could give a much more clarity regarding the market concentration. Here the value is 0.2125. An HHI between 0.15 and 0.25 indicates a moderately concentrated market. Therefore, this market was moderately to highly concentrated, meaning a few firms have significant control over it.

PADDICO brand was the one and only rice brand from co-operative sector, holds a 1.04 per cent market share. It indicates that it plays a relatively small role in the branded rice market.

4.2 Market concentration by using Gini coefficient

The Gini coefficient is a statistical measure commonly used to assess the level of inequality in market share and concentration the firms within an industry. In the branded rice market, it helps to understand how evenly or unevenly the market share is distributed among different rice manufacturers. The Gini coefficient ranges from 0 to 1, where a value of 0 represents perfect equality (all firms have equal market share), and a value closer to 1 indicates high inequality (a few firms dominate the market).

Table 3 classifies rice manufacturers based on their range of sales quantities, showing the proportion on number of them within each range and cumulative share of yearly sales. By calculating these proportions, the Gini coefficient provided more insight into the concentration of market power among rice millers. This attempt helped to get a clearer picture to identify how competitive or concentrated the branded rice market. A Lorenz curve was also drawn for the graphical representation of the same.

Table 3 Market concentration by using Lorenz curve (n=16)

Range of sale Qty (lakhs. Qtl)	No.of manufacturers	Proportion of rice manufacturers (X)	Cumulative proportion of rice manufacturers	Total sales (in million ₹)	Proportion of sales	Cumulative share of yearly sales	XY
Below 2	11	0.69	0.69	2179.06	0.09	0.09	0.06
2-6	1	0.06	0.75	1102.31	0.04	0.13	0.01
6-10	1	0.06	0.81	2868.48	0.12	0.25	0.02
10-14	1	0.06	0.88	4441.70	0.18	0.43	0.03
Above 14	2	0.13	1.00	14164.31	0.57	1.00	0.13
Total	16	1.00		24755.86	1.00		0.24
						Gini coefficient	**0.76**

Source: Compiled from annual reports of rice manufacturers, 2022-23

Table 3 highlighted that a small proportion of rice manufacturers, particularly those selling in the highest quantity range (above 14 lakhs quintals), control a significant portion of the market. They were with just two firms accounting for 57 percent of total yearly sales. The Gini coefficient of 0.76 suggests a high level of inequality in the market. It indicates that, a few firms dominate the majority of sales. This concentration of market power implies limited competition, where the top players have a substantial influence over the market. At the same time smaller firms have relatively little impact on overall sales.

Alongside the Gini coefficient, the Lorenz curve is used for graphical representation. It depicts the cumulative share of yearly sales in the rice market. The Lorenz curve helps to illustrate the degree of inequality by comparing the actual distribution with a line of perfect equality. The farther the curve is from the line of equality, the greater the market concentration.

The Lorenz curve reflected that; it is significantly bowed away from the line of perfect equality. This means that a relatively small percentage of rice manufacturers are responsible for a large share of the total sales. While the majority of rice manufacturers have a smaller share of sale. This result is consistent with high concentration ratio (CR_4) and HHI values, both of which would reflect a moderately to highly concentrated market structure where a small number of firms dominate.

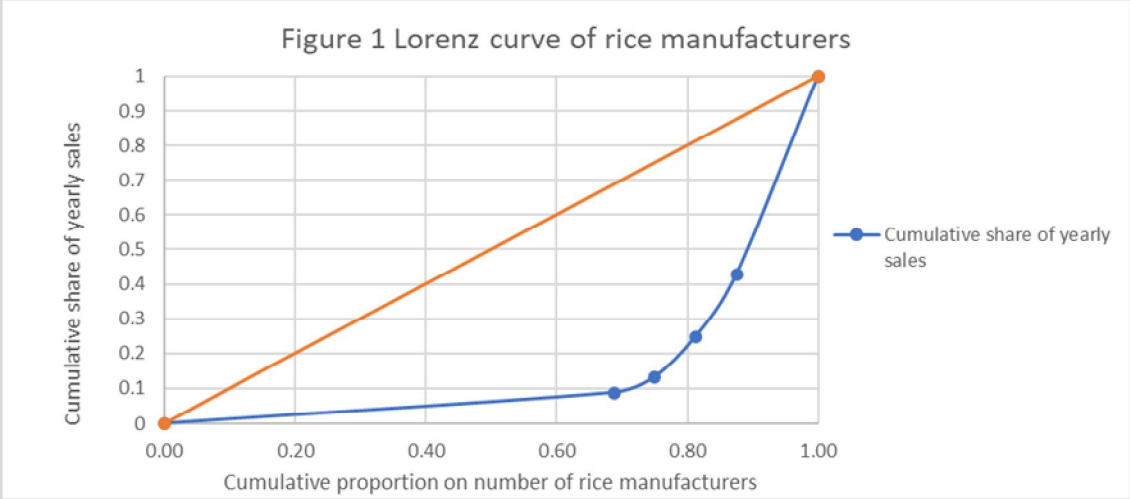


Table 4 Summary of concentration of branded rice market

Concentration ratios	Values
CR_4 based on sales value (%)	86.75
HHI	0.2125
Gini coefficient	0.76

All these tools together are important for understanding the market dynamics, as they provide insights into whether the market is competitive or dominated by few large players. By analysing the three concentration ratios and Lorenz curve, it can be concluded that the branded rice market follows a significant oligopolistic behaviour. The first five firms listed namely Pavizham, Keerthi nirmal, Periyar, Kottaram, and Jayabharath were exporters, with four of them accounting for 86.43 per cent of the total market share. This proven the idea of significant market concentration among a few top players in the industry. After conducting the research, it could be identified that the influence of Kalady rice miller's consortium in the branded rice market. The consortium plays a crucial role in maintaining the rice supply chain and pricing strategies to meet both domestic and export demands. A few powerful brands, who are the members of the consortium, clearly dominate the branded rice market.

5. CONCLUSION

In conclusion, the branded rice market in Kerala exhibits significant oligopolistic tendencies, with a small number of dominant players controlling a substantial portion of the market. The analysis using concentration ratios and the Lorenz curve highlights that a few key firms—Pavizham, Keerthi Nirmal, Periyar, Kottaram, and Jayabharath—had a stronghold in the market, indicating limited competition. Additionally, the Kalady Rice Miller's Consortium plays a critical role in maintaining the rice supply chain, ensuring stability in both domestic and export markets. The influence of these key players underscores the concentrated nature of the branded rice market in Kerala.

The study suggests fostering greater competition in Kerala's branded rice market by encouraging the entry of new players. If the market was perfectly competitive, the pricing policies can be change and it may favourable to the consumers. The high investment requirement in this sector, discourage the new players to enter into the market. It can be overcome through financial incentives and technical support for small and medium enterprises. Strengthening cooperative rice mills with government support could help balance the market power of large private firms. Additionally, regulatory measures to ensure fair pricing practices and increased transparency in the supply chain are recommended to protect smaller producers and consumers. Promoting regional branding initiatives would also provide smaller producers with opportunities to compete, offering consumers more choices and reducing market dominance by a few key players.

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