MARKET POTENTIAL AND FARMERS' BUYING BEHAVIOUR TOWARDS CUMIN SEEDS IN RAJKOT DISTRICT, GUJARAT

ABSTRACT

The Indian agriculture sector, which contributes 18.3% to the country's GDP, heavily relies on quality seeds for optimal crop productivity. The Indian seed industry, currently ranked 5th globally with a turnover of nearly 9000 crores, plays a crucial role in providing high-quality seeds to farmers. Hybrid seeds are preferred over open-pollinated varieties, occupying 65% of the area. Quality seeds not only increase yield but also reduce the requirement for other inputs, thereby lowering production costs. The Indian spice industry has also shown significant growth, with exports increasing by 82% in volume and 131% in value (INR) from 2013-14 to 2022-23. The major spices exported include chili, cumin, spice oils & oleoresins, and mint products, with China, USA, and Bangladesh being the top export destinations. The seed sector has been instrumental in India's agricultural progress, particularly since the Green Revolution, where the adoption of high-yielding varieties and crop hybrids responsive to fertilizers and irrigation led to self-sufficiency in food production. Quality seeds alone can increase crop productivity by 20-25%. The Indian seed industry, being the eighth largest globally, holds a 4% market share and is poised for further growth in the coming years.

Keywords: Cumin, Seeds, Agriculture, Seed Industry,

1. INTRODUCTION

The agricultural sector in India is deeply rooted in its reliance on farming, with over half of the population dependent on it for their livelihood. Contributing about 18.3 percent to the country's GDP, agriculture remains a vital economic sector. Within this landscape, the seed industry plays a pivotal role as it forms the cornerstone of agricultural productivity. Essentially, seeds serve as the genetic blueprint for plant growth, containing all the necessary components for proper development and yielding. Therefore, the choice of seeds becomes crucial for farmers, as it directly impacts the success of their crops. India's seed industry has seen significant growth, with a turnover of nearly 9000 crores and a Compound Annual Growth Rate (CAGR) of 12.43 percent projected from 2023-2028. Hybrid seeds, which occupy 65 percent of the market share, are preferred over open-pollinated varieties, highlighting a shift towards advanced agricultural technologies. This transition has been instrumental in enhancing productivity, with high-yielding seed varieties leading to manifold increases in output from the

same area of land. (www.seedassociationofindia.com)

Quality seeds not only boost yields but also contribute to reducing production costs for farmers, making them a vital element in crop cultivation. Good quality seeds are classified based on purity, with various categories ensuring adherence to standards. The significance of seeds extends beyond mere productivity; they influence the entire agricultural ecosystem, affecting practices such as pest control, weeding, and overall farm management.

In the realm of spice production, India has emerged as a global leader, with exports witnessing a substantial increase over the years. The spice export basket, consisting of over 225 spices and products, contributes significantly to the country's economy. Major spices like chili, cumin, and turmeric dominate the export market, with China, the USA, and Bangladesh being prominent destinations. This underscores the importance of high-quality seeds in sustaining India's position as a leading spice exporter.

The evolution of India's seed industry has been marked by a transition from a predominantly public sector-driven model to one characterized by significant private sector participation. The initial phase saw the establishment of key national organizations like the National Seeds Corporation (NSC) and the State Farms Corporation of India Limited (SFCL), laying the groundwork for seed production and marketing. Subsequent decades witnessed the emergence of private seed firms, spurred by government policy reforms in the late 1980s. Today, the private sector commands a substantial share of the market, driven by advancements in research and development and a focus on high-value crops. Government regulations and policies have played a crucial role in shaping the trajectory of the seed industry. Acts like the Seed Act of 1966 and the Seeds Control Order of 1983 have provided a regulatory framework for quality control and certification. The introduction of the Plant Variety Protection and Farmer's Rights Act in 2001 aimed to safeguard the interests of both farmers and seed producers, ensuring fair practices and encouraging innovation. (www.seednet.gov.in)

The branding of seeds has emerged as a key strategy for seed firms, aimed at persuading farmers to adopt hybrid varieties. Marketing efforts focus on highlighting the benefits of hybrid seeds and building brand loyalty among farmers. However, challenges remain in establishing enduring brands that resonate with farmers over the long term.

1.1 OBJECTIVES

1. To know the socio-economic profile of the cumin farmers

2. To identify the farmers' buying behavior towards the cumin seeds
3. To identify the market potential of cumin seeds in Rajkot district
4. To identify the problems faced by cumin farmers

2. MATERIALS AND METHODS

The research methodology involved interviews with respondents using a Structured Schedule designed to address the above-mentioned objectives. Subsequently, statistical tools were employed to analyze their responses. The study was specifically conducted in the chosen villages of Botad district. Primary data were collected directly from farmer respondents, while secondary data were sourced from literature, private and government publications, as well as websites. Employing a descriptive approach, the research explored and elucidated various factors pertinent to cotton farming. A non-probability sampling technique, specifically convenience sampling, was utilized to select 300 cumin farmers in the Botad district. The survey spanned a period of 90 days and employed a structured schedule as its primary tool. Data analysis encompassed tabular analysis and the computation of the Weighted Average Mean, Garret Score, Market Potential Formula, and Principal Component Analysis facilitating the extraction of meaningful insights from the gathered data.

3. RESULTS AND DISCUSSION

3.1 The socio-economic profile of farmers

Table 1 The socio-economic profile of farmers

Sr. No.	Particulars	Respondents	Percentage
1	**Age**		
	Below 20	5	1.66
	21-35	102	34
	36-50	**180**	**60**
	Above 51	13	4.33
	Total	300	100
2	**Land Holding**		
	<1	41	13.66
	1 To 2	**159**	**53**
	2 To 4	78	26

	4 To 10	16	5.33
	10 & above	4	1.33
	Total	300	100
3	**Education status**		
	Illiterate	41	13.66
	Up to Primary	73	24.33
	Secondary	**116**	**38.66**
	Higher Secondary	56	18.66
	Graduate & above	14	4.66
	Total	300	100
4	**Annual income**		
	Less than1 lakh	53	17.66
	1-5 Lakhs	**179**	**59.66**
	5 - 10 Lakhs	60	20
	More than 10 Lakhs	8	2.66
	Total	300	100
5	**Farming Experience**		
	0 to 5	22	7.33
	5 to 10	72	24
	10 to 15	90	30
	More than 15	**116**	**38.66**
	Total	300	100

Respondents were categorized into different age groups. Below 20 years old comprised 1.66% of the respondents, while the majority fell within the age range of 21-35 years (34%). Those aged between 36-50 years constituted 60% of the respondents, and individuals above 51 years old accounted for 4.33% of the total.

Landholding among respondents varied. The majority, 53%, had land holdings ranging from 1 to 2 acres, followed by those with land holdings between 2 to 4 acres (26%). A smaller percentage had land holdings less than 1 acre (13.66%), between 4 to 10 acres (5.33%), and 10 acres and above (1.33%).

Respondents' education levels were diverse. The largest group had completed secondary education (38.66%), followed by those with education up to the primary level (24.33%). A

smaller percentage were illiterate (13.66%), had education up to higher secondary (18.66%), and were graduates or above (4.66%).

The distribution of respondents based on annual income varied. A majority fell within the income bracket of 1-5 lakhs (59.66%), followed by those earning less than 1 lakh (17.66%). A smaller percentage reported annual incomes between 5-10 lakhs (20%) and more than 10 lakhs (2.66%).

Respondents had diverse levels of farming experience. The highest percentage (38.66%) had more than 15 years of experience, followed by those with 10 to 15 years of experience (30%). A significant portion had 5 to 10 years of experience (24%), while a smaller percentage had 0 to 5 years of experience (7.33%).

3.2 CROPS GROWN IN VARIOUS SEASON

Table no 2 Crops grown in various seasons

Season	Crop	Respondents
Kharif	Cotton	145
	Groundnut	123
	Maize	8
	Vegetables	24
Rabi	Cumin	300
	Wheat	186
	Gram	63
	Vegetables	29
Summer	Pearl millet	74
	Vegetables	23

During the 2023-24 kharif season, cotton emerged as the predominant crop choice, with 145 respondents reporting its cultivation, followed by groundnut with 123 respondents. Maize cultivation was reported by 8 respondents, while 24 respondents opted for vegetable cultivation. Conversely, in the Rabi season, wheat cultivation took precedence, with 186 respondents engaging in its cultivation, followed closely by cumin crops with 300 respondents. Additionally, 74 respondents cultivated gram, and 29 respondents intercropped vegetables with cumin crops. During the summer season, pearl millet was sown by 74 respondents.

3.3 SOURCE OF IRRIGATION OF RESPONDENTS

Table .3 Source of Irrigation of Respondents

Source of Irrigation	Frequency	Percentage
Well, Tube well	65	21.66
Well, Tube well, Canal	**89**	**29.66**
Well, Tube well, Canal, Pond/Check dam	21	7
Well, Canal	29	9.66
Tube well	50	16.66
Tube well, Canal	46	15.33
Total	**300**	**100.00**

In Rajkot District, farmers employ a diverse range of irrigation sources for their agricultural activities. The most prevalent combination is the use of wells or tube wells, favored by 21.66% of farmers. Additionally, 29.66% utilize a combination of wells, tube wells, and canals, while 7% rely on ponds or check dams alongside these sources. Furthermore, 16.66% solely rely on tube wells, whereas 9.66% exclusively utilize wells and canals. Lastly, 15.33% opt for a combination of canals and tube wells.

3.4 PROMOTIONAL ACTIVITY

Table .4 Promotional Activity

Tools/Activities	Frequency	Percentage
Demo / Farmers Meeting	65	21.66
TV / Paper Advertisement	25	8.33
Word of Mouth	61	20.33
Wall Printing / Jeep Campaign	52	17.33
Retailers' suggestion	**97**	**32.33**
Total	**300**	**100.00**

The provided data indicates sales promotional activities during the season, particularly focusing on demonstrations and farmers' meetings to raise awareness among farmers. Retailers' recommendations emerged as the most influential factor, with 32.33% attributing awareness creation to them in Rajkot district. Moreover, the study underscores the importance of word-of-mouth in effectively disseminating information and generating awareness among farmers.

3.4 FARMERS CONSIDER PURCHASING CUMIN SEEDS BASED ON DIFFERENT PARAMETERS.

Table 5 Farmers consider purchasing cumin seeds based on different parameters.

Extraction Method: Principal Component Analysis

Parameters	Components				
	Performance	Branding	Quality	Growth	Price
Increasing Income	.728				
Increasing Yield	.809				
Resistant against Pest and Disease	.702				
Past Experience	.599				
Dealer Advice	.883				
Easily Available	.878				
Promotional Activity		.701			
Brand Name in the market		.762			
Product Performance		.554			
Quality of Seed			.892		
Require Less Number of Spray			.764		
High Germination				.776	
Price					.925
Total Variance Explained(percent)	26.29	12.66	11.58	10.06	9.56

Thirteen parameters were assessed to gauge farmers' purchasing behavior regarding Impera cumin seeds. These parameters were rated on a scale of 1 to 5, and factor analysis was employed for analysis. The findings of the factor analysis indicated that a factor solution accounted for 70.71% of the total variance in the dataset.

3.5 SATISFACTION LEVEL FOR FARMERS USING CUMIN SEED

Table 6 Satisfaction level for farmers using Cumin seed.

Q. No	Reason	1	2	3	4	5	Total	WAM
1	Higher Yield	19	10	39	2	6	76	2.82
2	Seed Price	9	19	32	11	5	76	2.78
3	Germination Percentage	10	21	27	12	6	76	2.78
4	Pest & disease resistance	19	14	31	9	3	76	2.77
5	Market price of the output	15	14	32	6	9	76	2.75
6	Promotional activity	11	19	40	1	5	76	2.61
7	Dealers influence	18	20	18	13	7	76	2.6
8	Timely availability	7	29	20	8	11	76	2.55
9	Field advisory services	7	16	37	11	5	76	2.51
10	Overall satisfaction	93	154	280	80	57	684	2.69

The analysis of satisfaction levels towards the use of cumin seed utilized a Likert scale, where respondents rated their satisfaction on a scale of 1 (Highly satisfied) to 5 (Highly dissatisfied). The Weighted Average Mean was calculated by multiplying the scale values by their respective weights (1 to 5) and dividing by the number of respondents who used the cumin seeds. The findings from this analysis indicated that farmers' sentiments towards Cumin seeds were neither distinctly satisfied nor dissatisfied. The weighted average mean of all the parameters was between 2.5 and 3.0 (neutral), furthermore the overall WAM for satisfaction level of 2.69, which leans towards neutrality.

3.6 THE MARKET POTENTIAL OF CUMIN SEEDS IN THE RAJKOT DISTRICT

Table 7 The market potential of cumin seeds in the Rajkot district

	Rajkot District	Total
Total Cultivated area	535809 ha	535809 ha
Area under Cumin crop	29268 ha	29268 ha
Avg. Quantity required per Hectare (Kg/ha)	12 kg per ha	
Price of cumin per kg	250 ₹per Kg	
Total Market Potential	87,80,4000	

The data presented in the table sheds light on the cultivation and market potential of cumin within Rajkot District. With a vast total cultivated area of 535,809 hectares, the district demonstrates substantial agricultural activity. Of this area, 29,268 hectares are specifically allocated to the cultivation of cumin, highlighting the significance of this crop within the region's agricultural landscape.

On average, each hectare of cumin cultivation yields approximately 12 kilograms of the spice. This statistic underscores the productivity of cumin farming in Rajkot District. Moreover, the market price of cumin stands at ₹250 per kilogram, indicating its value in the local economy.

The culmination of these factors results in a considerable total market potential for cumin within the district, amounting to ₹87,804,000. This figure underscores the economic importance of cumin cultivation and trade in Rajkot District, highlighting its role in contributing to the agricultural and economic vitality of the region.

3.7 PROBLEMS FACED BY CUMIN FARMER

Table 8 problems faced by cumin farmer

Problems faced by farmers in Cumin	Mean Score	Rank
Cost of input	**78.01**	**1**
Cumin aphids	69.24	2
Climate change	63.33	3
Blight (*Alternaria burnsii)*	54.4	4
Powdery mildew disease	52.17	5
Labour	47.9	6
Wilting (fusarium oxysporum)	43.82	7
Uneven germination	38.05	8
Timely nonavailability of seed	30.96	9
Poor quality seed	22	10

The problem areas in cumin cultivation vary significantly in severity and impact, as reflected by their mean scores and ranks. The cost of input emerges as the most pressing concern, with a mean score of 78.01, ranking 1st. Following closely behind is the prevalence of Cumin Aphids, ranking 2nd with a mean score of 69.24. Climate change ranks 3rd, with a mean score of 63.33, while Blight (*Alternaria burnsii)* issues follow in the 4th position with a mean score of 54.4. Powdery mildew disease ranks 5th with a mean score of 52.17, indicating a considerable problem. Labour, ranking 6th with a mean score of 47.9. Wilting (fusarium oxysporum), though lower in rank, still presents challenges, ranking 7th with a mean score of 43.82. The Uneven germination, Timely nonavailability of seed, and Poor-quality seed, though concerning, rank lower in comparison, with mean scores of 38.05, 30.96, and 22 respectively. These insights highlight the diverse range of challenges faced in groundnut cultivation, ranging from input costs to various pest and disease pressures, necessitating targeted interventions and strategies for sustainable improvement.

4. CONCLUSION:

The agriculture sector in India, particularly in Rajkot District, is marked by a robust seed industry and thriving spice production, with cumin being a focal crop. Although there is high awareness of various seed brands, there is room for growth in market penetration and customer satisfaction. The predominant middle-aged farmer demographic, coupled with varying education and income levels, shapes the purchasing behavior and challenges faced in the region. Addressing issues such as high input costs, pest management, and climate resilience is crucial for enhancing productivity and sustaining the agricultural economy. The potential for cumin seed market expansion is substantial, indicating a promising future for the seed industry with strategic improvements and targeted outreach.

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