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Purchase behaviour and constraints of paddy farmers towards hybrid paddy seeds in Tapi District of South Gujarat

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Abstract

Hybrid paddy seeds play a vital role in enhancing rice productivity, improving grain quality, and increasing farmers' income. Understanding farmers' purchase behaviour and the constraints they face is essential for promoting the adoption of hybrid paddy seeds. The present study was conducted in Tapi district of South Gujarat region; to analyze the purchase behaviour and constraints of paddy farmers towards hybrid paddy seeds. Descriptive cross-sectional research design was adopted, and primary data were collected from 100 hybrid paddy farmers through a structured interview schedule using multistage sampling technique. The study revealed that the majority of farmers were middle-aged, educated up to SSC level, possessed small landholdings, and had 11-20 years of farming experience. Most respondents preferred short-duration hybrid paddy varieties and purchased seeds through local dealers. Company representatives and field demonstrations were the major sources of information influencing farmers' purchasing decisions. Dual benefits of the product (grain and fodder), price, and company representatives' influence at the point of sale were the most important factors considered while buying hybrid paddy seeds. High seed price emerged as the most significant constraint, followed by lack of technical knowledge, untimely availability of seeds, and market fluctuations. The study suggests strengthening dealer networks, promoting field demonstrations, providing technical guidance, introducing affordable pricing strategies, and improving seed availability to enhance farmer adoption and satisfaction towards hybrid paddy seeds.

Keywords: Agricultural marketing, agri-input, constraints, hybrid paddy, paddy farmers, purchase behaviour

Introduction

Agriculture remains one of the most important sectors of the Indian economy, supporting the livelihoods of a large proportion of the rural population and contributing significantly to national food security. Among agricultural inputs, seed is considered the most critical factor influencing crop productivity and quality. The use of high-quality seeds can increase crop yields by 15–20% when combined with recommended agronomic practices. In recent years, the Indian seed industry has experienced rapid growth due to technological advancements, increasing farmer awareness, and greater participation of private seed companies (Spielman *et al.*, 2013; NSAI, 2024) ^[11, 4].

Paddy (*Oryza sativa* L.) is one of the most important cereal crops cultivated in India and serves as the staple food for a large segment of the population. India is among the world's leading producers of rice, with substantial cultivation occurring across various agro-climatic regions. Hybrid paddy seeds have gained importance because of their potential to provide higher yields, improved resistance to pests and diseases, and better adaptability to adverse environmental conditions. These characteristics make hybrid seeds an important tool for enhancing farm productivity and ensuring food security (Spielman *et al.*, 2013; USDA.gov, 2025) ^[11, 13].

Farmers' purchase behaviour towards hybrid paddy seeds is influenced by several socio-economic and marketing-related factors, including product quality, price, availability, company reputation, dealer recommendations, and promotional activities. Sources of information such as company representatives, field demonstrations, progressive farmers, and extension agencies also play a significant role in shaping farmers' buying decisions. Understanding these behavioural aspects is important for seed companies, policymakers, and agricultural extension organizations to develop effective strategies for promoting improved seed technologies and increasing adoption among farmers (Pandey *et al.*, 2020; Jain & Rathore, 2023) ^[5, 1].

Despite the advantages offered by hybrid paddy seeds, farmers continue to face several constraints that limit their adoption and utilization. High seed prices, lack of technical knowledge, untimely availability of seeds, market fluctuations, and inadequate access to credit are among the major challenges reported by farmers. These constraints affect purchasing decisions and reduce the potential benefits of hybrid seed technology. Therefore, the present study focusing on Purchase Behaviour and Constraints of Paddy Farmers towards Hybrid Paddy Seeds in tribal belt of Tapi District was undertaken to analyse farmers' buying behaviour and identify the key constraints affecting hybrid

paddy seed adoption.

Objectives of the Study

1. To study the socio-economic profile of hybrid paddy farmers.
2. To study farmers' purchase behaviour towards hybrid paddy seeds.
3. To study the factors considered by farmers while buying hybrid paddy seeds.
4. To analyze the constraints of paddy farmers towards hybrid paddy seeds.

Review of Literature

The review of literature provides valuable insights into the socio-economic profile, purchase behaviour, factors influencing buying decisions, and constraints faced by paddy farmers towards hybrid paddy seeds. It helps in understanding previous research findings, identifying knowledge gaps, and establishing a strong conceptual foundation for the present study.

Spielman *et al.* (2013) ^[11] examined the development and adoption of hybrid rice in India. The study found that seed price, yield potential, grain quality, and seed credibility significantly influenced farmers' adoption decisions. High seed costs, limited technical knowledge, weak technology dissemination, and subsidy-related issues were identified as major constraints affecting adoption.

Tengli and Sharma (2017) ^[12] studied the constraints in adopting improved paddy cultivation practices in South Gujarat. The study identified labour shortages, high input costs, and low market prices as the major constraints faced by farmers. Inadequate input supply, limited technical knowledge, poor marketing facilities, and difficulties in obtaining credit were also reported as significant barriers to adoption.

Prakash *et al.* (2017) ^[6] studied the constraints faced by farmers in the production of inbred and hybrid rice in Uttarakhand. The study revealed that high seed cost, pest and disease incidence, and inadequate availability of fertilizers were the major constraints affecting hybrid rice cultivation. Shortage of quality inputs, irrigation problems, labour scarcity, and price fluctuations further limited the large-scale adoption of hybrid rice.

Salunkhe and Pandya (2017) ^[7] studied the relationship between farmers' characteristics and adoption of paddy production technology in Navsari district, Gujarat. The study found that education, annual income, and farming experience significantly influenced technology adoption, while several socio-economic and psychological factors showed positive associations. The findings highlighted the importance of farmers' personal and behavioural characteristics in determining adoption decisions.

Salunkhe *et al.* (2019) ^[8] studied the socio-economic and psychological characteristics of paddy growers in Tapi district, Gujarat. The study revealed that the majority of farmers were middle-aged, educated up to the secondary level, and had medium farming experience. Most respondents exhibited medium levels of economic motivation, scientific orientation, and risk orientation, indicating their influence on farmers' decision-making and adoption behaviour.

Negi *et al.* (2020) ^[3] studied the adoption and impact of hybrid rice in India using a large-scale farm household

survey. The study found that hybrid rice provided a 16–20 percent yield advantage over traditional varieties, while adoption was influenced by irrigation access, institutional credit, and extension services. High seed costs, limited technical awareness, and modest profitability were identified as major constraints affecting wider adoption.

Pandey *et al.* (2020) ^[5] studied the buying behaviour of hybrid paddy seed growers across six districts of Bihar. The study found that dealers and retailers were the major sources of information, while plant height, grain quality, and waterlogging tolerance significantly influenced purchase decisions. Brand preference was driven by product performance, company support, timely availability, credit facilities, discounts, and technical guidance.

Singh *et al.* (2022) ^[10] studied the socio-economic profile and constraints of paddy farmers in Uttar Pradesh. The study found that most farmers were middle-aged with small to medium landholdings, and that yield performance, seed quality, and profitability were the key factors influencing seed purchase decisions. High seed cost, inadequate technical knowledge, limited availability, and lack of credit facilities were identified as major constraints to adoption.

Sengar and Ramchandra (2023) ^[9] studied the socio-economic profile of wheat and paddy growers in Uttar Pradesh. The study revealed that most farmers belonged to nuclear families, depended primarily on agriculture, and had moderate literacy with low higher education levels. Education, occupation, economic status, and social background were found to influence farmers' livelihoods and decision-making behaviour.

Jain and Rathore (2023) ^[1] studied farmers' buying behaviour towards agricultural inputs in Punjab. The study found that quality, price, brand, and advertisements were the major factors influencing purchase decisions, while dealers, retailers, relatives, and friends served as important information sources. Local markets were the preferred purchase points, and farmers largely relied on self-decision while buying agricultural inputs.

Joshi *et al.* (2025) ^[2] studied the constraints perceived by farmers in procuring hybrid paddy seeds in Vyara taluka of Tapi district, Gujarat. The study identified high seed price as the most critical constraint, followed by timely availability, market fluctuations, and lack of credit facilities. Poor seed quality, limited technical knowledge, poor crop performance, and low awareness were also reported as factors affecting hybrid paddy seed adoption.

The reviewed studies demonstrate that farmers' adoption and purchase decisions regarding hybrid paddy seeds are largely influenced by socio-economic characteristics, product attributes, information sources, and perceived economic benefits. Several studies also highlighted constraints such as high seed prices, inadequate technical knowledge, limited availability, and credit-related issues. These findings provide valuable insights and a strong foundation for the present study on the purchase behaviour and constraints of paddy farmers towards hybrid paddy seeds.

Materials and Methods

Study Area

The present study was conducted in purposively selected tribal belt of Tapi district of South Gujarat region. This region was purposively selected due to its significant area

under paddy cultivation and the widespread adoption of hybrid paddy seeds among farmers. The region is characterized by favourable agro-climatic conditions, including adequate rainfall, fertile soils, and a predominantly agriculture-based economy, making it suitable for paddy cultivation. The area also has an active network of seed dealers, agro-service centres, company representatives, and extension agencies, which directly influence farmers' awareness, purchase decisions, and adoption of hybrid paddy seeds.

Research Methodology

The study employed a descriptive cross-sectional research design to examine the purchase behaviour and constraints of paddy farmers towards hybrid paddy seeds. Both primary and secondary data were utilized for the study. Primary data were collected through personal interviews using a structured interview schedule, while secondary information was obtained from research articles, journals, reports, company publications, and relevant online sources.

Multi-stage sampling technique was adopted for selecting respondents. In the first stage, Songadh taluka was purposively selected from the seven talukas of Tapi district because of its extensive paddy cultivation. In the second stage, ten villages namely Dhamodi, Amlipada, Borda, Dhajamba, Chorvad, Dosvada, Hiravadi, Pipalkuva, Raniamba, and Tokarva were selected randomly. In the final stage, ten hybrid paddy-growing farmers were randomly selected from each village, resulting in a total sample size of 100 respondents.

The collected data were analyzed using tabular methods and statistical tools such as frequency distribution, percentage analysis, mean scores, and Likert scale analysis. These tools were used to examine the socio-economic profile of farmers, their purchase behaviour, factors influencing buying decisions, and constraints faced in the adoption of hybrid paddy seeds.

Results and Discussion

Socio-Economic profile of hybrid paddy farmers

Table 1: Study the socio-economic profile of hybrid paddy farmers

Variables	Parameters	Frequency	Percentage (%)
Gender	Male	84	84.00
	Female	16	16.00
Age	Below 21	0	0
	21–30 years	11	11.00
	31–40 years	32	32.00
	41–50 years	36	36.00
	51–60 years	12	12.00
	Above 60 years	9	9.00
Education Qualifications	Below SSC	9	9.00
	SSC	57	57.00
	HSC	23	23.00
	Graduate	11	11.00
	Post Graduate	0	0
Farming Experience	Below 5 years	8	8.00
	5 – 10 years	23	23.00
	15 – 20 years	48	48.00
	More than 20 years	21	21.00
Occupation	Farming	28	28.00
	Farming + AH	58	58.00
	Farming + Service	8	8.00
	Farming + Business	6	6.00
Land holding Size (Ha)	Marginal (up to 1 ha)	38	38.00
	Small (1.01–2.00 ha)	47	47.00
	Semi-medium (2.01–4.00 ha)	13	13.00
	Medium (4.01–10.00 ha)	2	2.00
	Large (more than 10 ha)	0	0
Type of Farming	Irrigated	58	58.00
	Rainfed	42	42.00
Sources of Irrigation	Bore Well	38	66.00
	River	14	24.00
	Canal	0	0
	Open Well	6	10.00
Annual Family Income (₹)	Below ₹1,00,000	13	13.00
	₹1,00,001 – ₹2,00,000	22	22.00
	₹2,00,001 – ₹3,00,000	36	36.00
	₹3,00,001 – ₹4,00,000	23	23.00
	₹4,00,001 – ₹5,00,000	4	4.00
	Above ₹5,00,000	2	2.00
Area Under Hybrid Paddy Cultivation	Up to 1 ha	52	52.00
	1–2 ha	43	43.00
	2.01–4 ha	4	4.00
	4.01–10 ha	1	1.00
	More than 10 ha	0	0

The socio-economic profile of the respondents revealed that the majority of hybrid paddy farmers were male (84%), while female farmers accounted for 16%. Most respondents belonged to the middle-aged group of 41-50 years (36%), followed by 31-40 years (32%), indicating an active and experienced farming population. In terms of education, a majority of farmers had completed SSC education (57%), followed by HSC (23%) and graduation (11%). Nearly half of the respondents (48%) possessed 11-20 years of farming experience, reflecting substantial practical knowledge in agricultural activities. Regarding occupation, 58% of farmers were engaged in both farming and animal husbandry, whereas 28% depended solely on farming. Landholding analysis showed that 47% of farmers belonged to the small farmer category (1.01-2.00 ha), while 38% were marginal farmers. Irrigated farming was practiced by 58% of respondents, with borewell irrigation being the predominant source among irrigated farmers. Further, the majority of respondents (36%) reported an annual family income between ₹2,00,001 and ₹3,00,000, and 52% cultivated hybrid paddy on up to one hectare of land, indicating the dominance of small-scale paddy cultivation in the study area.

Paddy farmers' purchase behaviour towards hybrid paddy seeds

The study revealed distinct purchasing patterns among hybrid paddy farmers in the study area. A majority of the respondents (54%) preferred short-duration hybrid paddy varieties, followed by medium-duration (27%) and long-duration varieties (19%). Company representatives emerged as the most important source of information regarding hybrid paddy seeds, followed by field demonstrations and farmers' meetings, highlighting the significant role of personal communication and extension activities in influencing purchase decisions. The majority of farmers

(89%) purchased hybrid paddy seeds from local dealers, while only 11% obtained seeds through co-operative societies, indicating a strong dependence on local retail networks. Regarding payment preferences, most farmers (76%) preferred cash transactions, followed by digital payments (17%) and credit purchases (7%). In terms of packaging, the 1 kg seed pack was the most preferred size, with 76% of respondents opting for it, followed by the 3 kg pack (16%) and 900 g pack (8%). These findings indicate that farmers prefer easily accessible purchasing channels, direct company interaction, cash-based transactions, and convenient packaging sizes while purchasing hybrid paddy seeds.

Factors considered by paddy farmers while buying hybrid paddy seeds

The analysis of factors influencing farmers' buying decisions towards hybrid paddy seeds revealed that the dual benefits of the product (grain and fodder) were the most important consideration, receiving the highest mean score of 4.37. This was followed by price (4.18), indicating that economic returns and affordability play a crucial role in seed selection. The influence of company representatives at the point of sale ranked third with a mean score of 3.91, highlighting the importance of direct interaction and technical guidance during purchase decisions. Past experience with the seed (3.82) and product quality (3.59) was also found to significantly influence farmers' preferences, reflecting the value placed on performance and reliability. Dealers' recommendations received a moderate mean score of 3.46, suggesting that local input retailers continue to influence seed choices. Packaging size was the least influential factor, with a mean score of 3.10. Overall, the findings indicate that farmers primarily focus on economic benefits, affordability, and trusted information sources while purchasing hybrid paddy seeds.

Table 2: Factors considered by paddy farmers while buying hybrid paddy seeds (n=100)

Sr. No.	Factors	HI (5)	I (4)	N (3)	SI (2)	UI (1)	CS	Mean	Rank
1	Price	47 (235)	36 (144)	8 (24)	6 (12)	3(3)	418	4.18	2
2	Product Quality	32 (160)	26 (104)	20 (60)	13 (26)	9(9)	359	3.59	5
3	Packaging Size	19 (95)	21 (84)	24 (72)	23 (46)	13 (13)	310	3.10	7
4	Dealers' Recommendation	25 (125)	29 (116)	21 (63)	17 (34)	8(8)	346	3.46	6
5	Past Experience	35 (175)	32 (128)	19 (57)	8 (16)	6(6)	382	3.82	4
6	Company Representatives' Influence at POS	41 (205)	28 (112)	18 (54)	7 (14)	6(6)	391	3.91	3
7	Dual Benefits of the Product (Grain + Fodder)	55 (275)	34 (136)	6 (18)	3 (6)	2(2)	437	4.37	1

Highly important: 5, Important: 4, Neutral: 3, Somewhat important: 2, Unimportant: 1

Cumulative Score (CS) = Maximum Scale × No. of Farmers

Mean = Cumulative Score (CS) / Total No. of Farmers (100)

Constraints faced by Paddy Farmers towards Hybrid Paddy Seeds

The study identified several constraints affecting the adoption and purchase of hybrid paddy seeds among farmers. Among the various constraints analyzed, high seed price emerged as the most significant challenge, receiving the highest mean score of 4.43, indicating that the cost of hybrid seeds acts as a major barrier for many farmers. Lack of technical knowledge ranked second with a mean score of 3.84, highlighting the need for greater extension support and farmer training regarding the proper selection and cultivation of hybrid varieties. Timely availability of seeds

was the third most important constraint (mean score 3.80), followed by market fluctuations (3.56), which create uncertainty in farmers' purchasing decisions and profitability. Non-availability of credit facilities (3.05) and poor seed quality (3.00) were perceived as moderately important constraints. In contrast, poor crop performance (2.74) and lack of awareness (2.32) were considered less severe issues by the respondents. Overall, the findings indicate that economic, technical, and supply-related factors are the major obstacles influencing farmers' adoption and purchase of hybrid paddy seeds.

Table 3: Constraints faced by Paddy Farmers towards Hybrid Paddy Seeds (n=100)

Sr. No.	Constraints	SA (5)	A (4)	N (3)	D (2)	SD (1)	CS	Mean	Rank
1	High Price	60 (300)	30 (120)	5 (15)	3 (6)	2 (2)	443	4.43	1
2	Lack of Technical Knowledge	32 (160)	37 (148)	19 (57)	7 (14)	5 (5)	384	3.84	2
3	Timely Availability	30 (150)	40 (160)	15 (45)	10 (20)	5 (5)	380	3.80	3
4	Market Fluctuations	24 (120)	35 (140)	20 (60)	15 (30)	6 (6)	356	3.56	4
5	Poor Seed Quality	10 (50)	25 (100)	30 (90)	25 (50)	10 (10)	300	3.00	6
6	Non-availability of Credit Time	12 (60)	28 (112)	25 (75)	23 (46)	12 (12)	305	3.05	5
7	Poor Crop Performance	9 (45)	20 (80)	25 (75)	28 (56)	18 (18)	274	2.74	7
8	Lack of Awareness	6 (30)	12 (48)	20 (60)	32 (64)	30 (30)	232	2.32	8

Strongly Agree: 05; Agree: 04; Neutral: 03; Disagree: 02; Strongly Disagree: 01

Cumulative Score (CS) = Maximum Scale × No. of Farmers

Mean = Cumulative Score (CS) / Total No. of Farmers (100)

Conclusion

The study clearly highlights the socio-economic profile, purchase behaviour, influencing factors, and constraints of hybrid paddy seed adoption among farmers in Tapi district. The findings revealed that the majority of farmers were in the middle age group (31–50 years), had low to moderate education levels, and primarily belonged to marginal and small landholding categories with modest annual incomes. Most respondents combined farming with animal husbandry and relied heavily on local dealers for seed purchases, with company representatives and field demonstrations serving as their major sources of information. Dual benefits of the product (grain and fodder), past experience, and company representatives' influence at the point of sale emerged as key factors shaping purchasing decisions, while high seed price was identified as the foremost constraint. Despite these challenges, farmers who had consistently positive experiences with hybrid seeds expressed satisfaction with their performance, particularly in terms of yield, quality, and resistance to pests and drought. Overall, the study underscores the importance of affordability, awareness, and performance-based communication in strengthening farmer adoption of hybrid paddy seeds.

Suggestions

Seed companies should develop and promote hybrid paddy varieties offering dual benefits of higher grain yield and quality fodder to meet the needs of farmers engaged in both crop cultivation and animal husbandry.

Local dealer networks should be strengthened through timely seed supply, adequate stock availability, and technical training to improve farmer access and support.

Affordable pricing strategies, smaller pack sizes, flexible credit facilities, and seasonal promotional schemes should be introduced to enhance seed affordability for small and marginal farmers.

Regular field demonstrations, farmer meetings, and extension programs should be organized to improve awareness, confidence, and adoption of hybrid paddy seeds. Assisted digital seed purchasing facilities at local service centres should be promoted to encourage online adoption and improve seed accessibility.

Practical training programs on seed selection, cultivation practices, and crop management should be conducted to bridge technical knowledge gaps and improve hybrid seed performance.

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