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STUDY ON MARKETABLE SURPLUS AND MARKETING OF LITCHI IN SAMASTIPUR DISTRICT OF BIHAR

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ABSTRACT

Litchi, a tropical fruit from Southeast Asia, is a key focus of a study in Bihar's Samastipur district. Litchi fruit is a nutritious and high-nutrient source of vitamins and minerals, including vitamin C, potassium, copper, and other essential minerals. It's low in calories and high in fiber, making it a healthy choice for weight management. The study will focus on the production of litchi in Tajpur , a randomly selected village, and will use primary and secondary data from farmers, block development offices, and government records. Analytical tools will include ranking, percentage approaches, tables, charts, and graphs. Summarizes a detailed report analyzing the demographic, economic, and operational characteristics of 110 agricultural respondents in a study focusing on small-scale farming in a specific region. The findings reveal a predominant presence of marginal farmers (less than 1 ha) and small farmers (1-2 ha), constituting 35.45% and 32.72% of the sample, respectively, highlighting the small-scale nature of agricultural operations in the area. The demographic profile indicates a youthful workforce with 48.63% of respondents aged between 18 and 35 years, alongside a significant gender imbalance with males comprising 78.18% of the sample. Educationally, the largest group has only attained junior high school level, with a notable 21.82% being illiterate, underscoring educational challenges in rural settings.

Keywords: Litchi Cultivation, Marketable Surplus, Marketing channels, Post-harvest losses, Samastipur district, Small -Scale farming, , Marketing efficiency.

INTRODUCTION

The Samastipur district of Bihar, renowned for its vibrant agricultural activities, stands out as one of the significant hub for litchi production in India. This study delves into the intricate Marketing mechanisms of litchi cultivation in this region, exploring every facet from cultivation to consumer markets. The purpose of this comprehensive investigation is to identify critical points in the Marketing that could be optimized to enhance efficiency and profitability for local farmers and stakeholders. Samastipur, provides an ideal climatic and geographical environment for litchi cultivation. The region's temperate climate, characterized by a hot summer and a moist winter, forms a conducive setting for litchi trees to

flourish. The fertile alluvial soil of the Gangetic plains further supports the growth of this demanding crop. Annually, the orchards of Samastipur come to life with the blooming of litchi, which generally begins around the second week of May and lasts until the end of June. This period is crucial not only for local agriculture but also significantly impacts the local economy.

The cultivation practices for litchi in Samastipur involve meticulous agricultural methods and significant labor input. The preparation of land starts well before the planting season, with farmers ensuring proper soil treatment and the setup of adequate irrigation systems to combat the dry spells. Pruning, fertilizing, and pest control are carried out with precision to maintain the health of the litchi trees. Despite the traditional nature of these practices, there is a growing interest among the farming community to integrate more modern agricultural techniques to increase yield and quality.

RESEARCH METHODOLOGY

The methodology used to select the district, the blocks, the villages and the respondents was purposively cum random sampling. The district of Samastipur was selected in order to avoid the inconvenience and time constraints on the investigator. All the blocks falling within the district of Samastipur were selected, and the block of Tajpur was selected based on the majority of respondents involved in Litchi cultivation. A separate list of villages was prepared for the selected block, and five percent of the villages from the selected block with a high number of respondents cultivating Litchi were randomly selected. From the villages, a list of all litchi cultivating farmers was prepared and then broken down into five size categories based on their land holding size. Marginal (less than 1 hectare), Small (1-2 hectares), Semi-medium (2-4 hectares), Medium (4-10 hectares), and Large (more than 10 hectares) were the size groupings. Using proportional random selection, 110 farmers who were cultivating litchi were chosen at random from the list. From the five percent of total villages were selected to study Marketable surplus and marketing of litchi in the study area. Primary data was collected through suitable designed schedule and Samstipur Market . Secondary data was collected from books/journal/report/records of district/blocks headquarters. Data from respondents were collected through survey methods via direct personal interview. Statistical tools were used to analyse the data and present the result. Data pertained to the agricultural year of 2024-2025.

Analytical Tools

- ***Chi-Square* : $\chi 2 = \Sigma(Oi - Ei)2/Ei$**
- ***Marketable surplus* = Total farm output produced by farmer - Own consumption of farm output.**
- ***MarketingCost=Cf+Cml+Cm2+Cm3 +Cmn***
- **Price spread= (Consumer Price-Net Price Received by the producer)*100/Consumer Price.**
- **Marketing Efficiency= FP ÷ MC + MM**
- **Garrett's Ranking= 100 (Rij-0.5) /Nj**

RESULTS AND DISCUSSION

Table 1: Distribution of respondents based on land holding.

S. No.	Categories (Respondents)	Respondent Number	Percentage
1.	Marginal (<1 ha)	39	**35.45%**
2.	Small (1-2 ha)	36	**32.73%**
3.	Semi-medium (2-4 ha)	11	**10.00%**
4.	Medium (4-10 ha)	16	**14.55%**
5.	Large (>10 ha)	8	**7.27%**
	Total	**110**	**100%**

Table 1: The table categorizes 110 respondents based on the size of their agricultural landholdings, ranging from less than one hectare to more than five hectares, thereby providing a nuanced view of land ownership patterns within a specified area. Marginal farmers, who operate on less than one hectare of land, constitute the largest segment of the population, making up 35.45% with 39 individuals. This significant proportion highlights the prevalence of small-scale farming within the community. Following them are the small farmers, owning between one and two hectares of land, representing 32.73% of the total with 36 respondents. This indicates a considerable number of farmers engaged in slightly larger, yet still limited, agricultural operations.

: Age- 49.09% were young age 18-35

: Gender 78.18% Male

: Education 24.55% illiterate

: Family type 51.81% Joint family

Table 2: Different marketing channels involved in the marketing of Litchi

Channel I	**Producer > Local Wholesalers > Retailers > Consumers**
Channel II	**Producer > Agricultural Markets (Mandis) > Supermarkets/Consumer**

Table 2: outlines the different marketing channels involved in the marketing of Litchi, identifying two main pathways through which Litchi reaches consumers. Channel I represents a traditional distribution model where producers sell their produce to local wholesalers, who then distribute to retailers, ultimately reaching the consumers. This pathway emphasizes the conventional supply chain involving multiple intermediaries. Channel II involves producers selling directly to agricultural markets, also known as Mandis, from where the produce is taken to supermarkets or specialty stores. This channel highlights the role of organized marketplaces in bridging producers with large retail formats. Each channel reflects a unique approach to marketing Litchi, catering to different segments of the market and distribution logistics.

Table 3: CHANNEL I: Producer > Local Wholesalers > Retailers > Consumers Price distribution in channel I.

S.No.	Particulars	Value in INR/kg
1.	Producer Sale Price to Local Wholesalers	**102**
	Cost Incurred by Local Wholesalers:	
i.	Packaging Cost	**2**
ii.	Labour Cost	**3**

iii.	Transportation Cost	**4**
iv.	Storage Cost	**1**
v.	Quality Grading & Processing Cost	**1**
vi.	Miscellaneous Charges	**1**
	Total Marketing Cost (i-vi)	**15**
vii.	Margin of Local Wholesalers	**10**
2.	Sale Price from Local Wholesalers to Retailers	**127**
	Cost Incurred by Retailers:	
i.	Packaging/Repackaging Cost	**2**
ii.	Labour Cost	**3**
iii.	Transportation/Logistics Cost	**2**
iv.	Storage and Refrigeration Cost	**3**
v.	Quality Maintenance Cost	**1**
vi.	Miscellaneous Charges	**1**
	Total Marketing Cost (i-vi)	**12**
vii.	Margin of Retailers	**20**
3.	Sale Price to Consumers	**159**
A.	**Total Marketing Cost**	**27**
B.	**Total Market Margin**	**30**
C.	**Marketing Efficiency**	**2.78**
D.	**Price Spread**	**57**

Table 3: In Channel I of litchi distribution, the path follows from producers to local wholesalers, then to retailers, and finally reaches consumers. The producers sell litchis to local wholesalers at ₹102 per kg. The wholesalers incur a total marketing cost of ₹12 (including expenses like packaging, labor, transportation, storage, quality grading, and miscellaneous charges) and add a margin of ₹10, bringing the sale price to retailers at ₹127 per kg. Retailers then incur their own marketing costs amounting to ₹12 for similar categories of expenses and add a margin of ₹20. This sets the final consumer sale price at ₹159 per kg. Overall, the total marketing cost across the channel amounts to ₹27, with a total market margin of ₹30. The marketing efficiency is calculated at 2.78, indicating the effectiveness of the marketing process. The price spread, which is the difference between the initial producer price and the final consumer price, is ₹57.

Table 4: Producer > Agricultural Markets (Mandis) > Supermarkets/Consumer Price distribution in channel II.

S.No.	Particulars	Valuein INR/kg
1.	Producer Sale Price to Agricultural Markets (Mandis)	**104**
	Cost Incurred by Agricultural Markets (Mandis):	
i.	Packaging Cost	**1.5**
ii.	Labour Cost	**2.5**
iii.	Transportation Cost	**3.5**
iv.	Storage Cost	**2**
v.	Quality Grading & Processing Cost	**1.5**

vi.	Miscellaneous Charges	**1**
	Total Marketing Cost (i-vi)	**12**
vii.	Margin of Agricultural Markets (Mandis)	**8**
2.	Sale Price from Mandis to Supermarkets	**124**
	Cost Incurred by Supermarkets:	
i.	Packaging/Repackaging Cost	**5**
ii.	Labour Cost	**1.5**
iii.	Transportation/Logistics Cost	**2**
iv.	Storage and Refrigeration Cost	**4**
v.	Quality Maintenance Cost	**1**
vi.	Miscellaneous Charges	**2.5**
	Total Marketing Cost (i-vi)	**16**
vii.	Margin of Supermarkets	**36**
3.	Sale Price to Consumers	**174**
A.	**Total Marketing Cost**	**28**
B.	**Total Market Margin**	**44**
C.	**Marketing Efficiency**	**2.41**
D.	**Price Spread**	**72**

Table 4: In Channel II for litchi distribution, the journey starts with producers selling litchis to agricultural markets (mandis) at ₹104 per kg. At the mandis, a total marketing cost of ₹12 is incurred, covering expenses such as packaging, labor, transportation, storage, quality grading, and miscellaneous charges. The mandis then add a margin of ₹8, setting the sale price to supermarkets at ₹124 per kg. Once the litchis reach supermarkets, they bear a marketing cost of ₹16 for similar operations but with different costs tailored to their operational scale. Supermarkets then add a substantial margin of ₹36, resulting in a consumer sale price of ₹174 per kg. Overall, this channel has a total marketing cost of ₹28 and a total market margin of ₹44. The marketing efficiency here is calculated at 2.41, reflecting the cost-effectiveness and value addition in this distribution path. The price spread, which indicates the difference between the initial and final sale prices, is ₹72.

Table 5: Physical post-harvest losses in Litchi

S.No.	Landholding Category	Initial Quantity (kg)	Final Quantity (kg)	Physical Loss (kg)	Loss Percentage (%)
1	Marginal (> 1 ha.)	500	430	70	**14**
2	Small (1-2 ha.)	1000	850	150	**15**
3	SemiMedium (2-4 ha.)	2000	1700	300	**15**
4	Medium (4-10 ha.)	5000	4350	650	**13**
5	**Large (>10 ha.)**	**10000**	**8800**	**1200**	**12**

Table 5: This pattern suggests that larger landholdings may have better resources and methods for reducing the percentage of post-harvest losses, although the absolute losses remain significant due to the larger volumes of Sesame handled.

Table 6: Economic post-harvest losses in Litchi

S.No.	Landholding Category	Physical Loss (kg)	Price/KG (INR)	Economic Loss (INR)
1	Marginal	70	800	**56000**
2	Small	150	800	**120000**
3	SemiMedium	300	800	**240000**
4	Medium	650	800	**520000**
5	**Large**	**1200**	**800**	**960000**

Table 6: This table illustrates the escalating financial impact of post-harvest losses as the quantity of produce and size of the landholding increase.

Table 7: Constraints associated with the marketing of litchi

S.No.	Constraints	Ranking out of 5					Garret Score	Ranking
		Strongly Agree (5/5)	Agree (4/5)	Neutral (3/5)	Disagree (2/5)	Strongly Disagree (1/5)		
1	High Transportation Costs	24	26	25	15	10	399	**I**
2	Inadequate Storage Facilities	30	25	25	10	10	355	**II**
3	LimitedAccess to Markets	25	30	20	15	10	345	**III**
4	Fluctuating Prices	27	25	23	15	10	344	**IV**
5	Limited Financing and CreditFacilities	26	24	25	15	10	341	**V**
6	Competition fromSynthetic Substitutes	20	28	27	18	12	341	**VI**
7	High Dependency on Intermediaries	25	25	25	15	10	340	**VII**
8	Regulatory and Policy constraints	17	28	30	12	18	329	**VIII**
9	Lack of Market Information	15	30	28	17	10	323	**IX**
10	**Quality Issues**	**20**	**20**	**30**	**15**	**10**	**310**	**X**

Table 7: The table titled "Constraints associated with the marketing of litchi" provides an assessment of various issues faced in the litchi market, using a weighted ranking system where stakeholders' agreement levels assign a corresponding score (Strongly Agree = 5, Agree = 4, etc.). The Garret Score is a composite metric that quantifies the perceived impact of each constraint, calculated by multiplying the number of responses in each category by the category's weight and summing these products.From the table, "High Transportation Costs" emerges as the most critical constraint, receiving the highest Garret Score of 399, which indicates it's viewed as the most significant issue by stakeholders, ranking it first. This is followed by "Inadequate Storage Facilities" and "Limited Access to Markets" with scores of 355 and 345 respectively, highlighting these as other major concerns in the distribution and marketing of litchis. Constraints like "Quality Issues" receive the lowest concern level, with a score of 310, ranking tenth. This table effectively captures and ranks the challenges in litchi marketing according to their perceived impact on the industry.

CONCLUSION

The analysis of agricultural dynamics among 110 respondents highlights a predominantly small-scale farming community, with 68.17% classified as marginal or small landholders. This significant proportion emphasizes the urgent need for targeted support mechanisms that enhance the sustainability and productivity of small-scale operations. The demographic profile reveals a youthful majority (49.09% under 35 years), suggesting a potential for driving innovation and adopting new agricultural technologies. However, the substantial gender imbalance, with males representing 78.18% of respondents, points to an underutilization of female labor and perspectives in the sector. This gender gap underscores the necessity for policies that promote inclusive growth and gender equality in agricultural practices. Educational levels among the farmers show a worrying trend, with 39.54% having only primary or no formal education, highlighting a barrier to the adoption of advanced agricultural techniques that require a basic educational background. Addressing this through customized educational programs could facilitate a more knowledgeable farming community, capable of improving yields and operational efficiency. The economic analysis provided by the post-harvest loss data indicates that larger landholders, despite lower loss percentages, incur substantial absolute financial losses (e.g., INR 960,000 for those with more than 10 ha). This suggests that improvements in post- harvest technologies and practices could yield significant economic benefits across all scales of operations, but particularly for larger producers who handle greater quantities of produce. Conclusively, the study signals the need for an integrated approach that combines educational initiatives, gender-inclusive policies, and technological advancements in post- harvest management. Such strategies would not only tackle the immediate inefficiencies and disparities but also set a foundation for a resilient and progressive agricultural sector that leverages its youthful demographic while ensuring sustainable growth and inclusivity

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