

Jackfruit Cultivation and Marketing: An Economic Study of Kolli Hills in Namakkal District

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Abstract- Jackfruit cultivation has emerged as a significant horticultural activity in the Kolli Hills of Namakkal District, Tamil Nadu, due to its suitability to hilly agro-climatic conditions and increasing market demand. This study provides an economic analysis of jackfruit cultivation and its associated marketing practices, with the objective of examining cost structures, profitability, and marketing channels. The research is based on primary data collected from farmers through structured interviews, supported by secondary data from government reports and agricultural sources. The findings reveal that jackfruit cultivation is economically viable for small and marginal farmers, characterized by relatively low input costs and favorable returns, as reflected in a positive benefit–cost ratio. Labour and transportation costs constitute a major share of total expenditure, while yield levels significantly influence profitability. Despite its potential, farmers face constraints such as price volatility, inadequate storage facilities, lack of organized market access, and heavy reliance on intermediaries, which reduce their share in the final consumer price. The study identifies various marketing channels, including direct sales, local markets, and intermediary-driven supply chains, and observes that farmers engaging in direct marketing or collective institutions such as farmer-producer organizations tend to realize better prices. The study concludes that jackfruit cultivation holds strong potential as a sustainable and income generating agricultural activity in hilly regions, provided that strategic interventions are implemented to strengthen production efficiency and market linkages.

Key words: Cultivation, Economic Analysis, Marketing Channels, Farmer Income, Tamil Nadu

I.INTRODUCTION

Jackfruit (*Artocarpusheterophyllus*) is one of the most important tropical fruit crops cultivated in India, valued for its nutritional richness, adaptability, and economic potential. In recent years, it has gained increasing attention as a climate-resilient crop suitable for marginal and hilly regions due to its low input requirements and ability to thrive contributing significantly to its cultivation, particularly in regions such as the Kolli Hills of Namakkal district. The fruit is rich in carbohydrates, vitamins, and dietary fiber, making it an important component of food security and nutrition (Morton, 1987; Swami et al., 2012, Rajasekar et al.,2025). Moreover, jackfruit has witnessed a surge in demand in both domestic and international markets due to its use in processed foods and as a plant-based meat alternative (Ranasinghe et al., 2019; FAO, 2020, Rajasekar & Sivagnanam, 2025). Despite its importance, jackfruit remains an underutilized crop in many parts of India, largely due to inadequate marketing infrastructure and limited value addition practices (Hossain, 2014; Singh & Singh, 2018).

The Kolli Hills region, located in the Eastern Ghats, provides a unique ecological setting that supports jackfruit cultivation as a major livelihood activity among small and marginal farmers. The region's terrain and climatic conditions favor the growth of jackfruit trees, which require minimal maintenance compared to other commercial crops. However, the economic potential of jackfruit cultivation in this area is influenced by various factors, including production costs, yield variability, labor availability, and market access (Rajasekar & Sivagnanam, 2025). Previous

studies have highlighted that while jackfruit cultivation offers high returns relative to investment, farmers often face challenges such as post-harvest losses, lack of storage facilities, and price instability (Reddy et al., 2016; Kumar et al., 2020). Additionally, the dominance of intermediaries in the marketing chain reduces farmers' bargaining power and limits their income realization (Birthal et al., 2015; Chand, 2017). These challenges necessitate a comprehensive analysis of both production economics and marketing systems to understand the true potential of jackfruit cultivation in the region.

In this context, the present study aims to analyze the economic aspects of jackfruit cultivation and examine the existing marketing channels in the Kolli Hills of Namakkal district. By focusing on cost structures, profitability, and price spread across different market intermediaries, the study seeks to identify key constraints and opportunities in the value chain. Understanding these dynamics is essential for formulating effective policy interventions that can enhance farmers' income and promote sustainable agricultural practices. The study also contributes to the broader discourse on agricultural diversification and rural development by emphasizing the role of underutilized crops in improving livelihoods (Pingali, 2012; Sivagnanam & Rajasekar, 2025; Dev, 2018). Furthermore, strengthening market linkages, encouraging farmer-producer organizations, and promoting value addition are critical strategies for improving the competitiveness of jackfruit in both local and global markets (World Bank, 2019; NABARD, 2021). Hence, this research provides valuable insights into the economic viability and market integration of jackfruit cultivation in a geographically unique and economically significant region.

II.OBJECTIVES OF THE STUDY

1. To analyze the cost and return structure of jackfruit cultivation in the Kolli Hills of Namakkal District.
2. To examine the profitability and economic viability of jackfruit production among farmers in the study area.
3. To identify and evaluate the existing marketing channels and price spread in the jackfruit supply

chain.

4. To assess the major constraints faced by farmers in cultivation and marketing, and suggest suitable measures for improvement.

III.REVIEW OF THE LITERATURE

Arathi and Ushadevi (2024) examined consumer behavior toward jackfruit products in Kerala and found increasing demand due to nutritional and environmental benefits. The study highlights the growing commercialization of jackfruit-based products in urban markets. It also emphasizes the role of awareness in influencing purchasing decisions. The authors conclude that value addition significantly enhances market potential. Singh et al. (2025) reviewed the nutritional and functional properties of jackfruit seeds, emphasizing their potential as value-added food ingredients. The study identifies high levels of proteins, fiber, and bioactive compounds. It also explores their applications in nutraceutical and pharmaceutical industries. The findings suggest reducing waste through seed utilization. Manianga et al. (2024) explored the role of jackfruit seeds as a sustainable food source in rural India. The study highlights their importance in food security and subsistence economies. It also emphasizes traditional knowledge systems in utilizing underexploited crops. The research supports integrating jackfruit into sustainable agricultural practices. Tripathy (2024) discussed jackfruit as a globally emerging fruit with economic and cultural significance. The study highlights its versatility in food processing and international markets. It emphasizes its role as a plant-based meat alternative. The paper concludes that jackfruit has strong export and commercial potential.

Parveen et al. (2024) reviewed the multifaceted uses of jackfruit in food, medicine, and industry. The study highlights its nutritional richness and adaptability. It also identifies opportunities in value-added products such as chips and flour. The authors stress the economic importance of full plant utilization. Reddy et al. (2019) conducted an economic analysis of jackfruit production and marketing in Tamil Nadu. The study evaluated cost structures, income levels, and price spread across marketing channels. It identified inefficiencies due to intermediaries. The findings highlight the need for improved marketing systems.

Gowda (2026) observed a significant rise in jackfruit prices due to increasing urban demand and value addition. The study notes a shift from whole fruit sales to processed bulb marketing. It highlights improved profitability for farmers. The research underscores the importance of market transformation in enhancing income. Kumar et al. (2023) analyzed the constraints in jackfruit cultivation and marketing in India. The study identified issues such as post-harvest losses and inadequate storage. It emphasized the role of infrastructure development. The authors recommend strengthening supply chains for better returns.

Birthal et al. (2022) studied agricultural commercialization and market linkages in India. The research highlights the dominance of intermediaries in horticultural markets. It suggests that farmers receive a smaller share of consumer prices. The study recommends institutional reforms for better efficiency. Chand (2021) examined price policies and agricultural marketing systems in India. The study highlights price volatility as a major challenge for farmers. It emphasizes the need for market reforms and digital platforms. The findings are relevant to perishable commodities like jackfruit. The FAO (2020) report highlights the global importance of underutilized crops like jackfruit. It emphasizes their role in food security and climate resilience. The report encourages diversification of agriculture. It also stresses value chain development for improving farmer income. NABARD (2021) focused on promoting farmer-producer organizations and rural agribusiness. The study highlights the role of collective marketing in improving price realization. It also emphasizes access to credit and infrastructure. The findings support strengthening jackfruit value chains.

Statement of the Problem

Jackfruit cultivation has gained increasing importance as a sustainable and economically viable horticultural activity in hilly regions such as the Kolli Hills of Namakkal District, Tamil Nadu. Despite its adaptability, low input requirements, and rising market demand, the crop remains largely underutilized in terms of its full economic potential. Farmers in the region continue to rely on traditional cultivation practices with limited access to scientific inputs, resulting in variability in yield and quality. Moreover, the absence of proper post-harvest management,

storage facilities, and processing units leads to significant losses, thereby affecting overall profitability. A major concern lies in the inefficient marketing system associated with jackfruit. Farmers often depend on intermediaries for the sale of their produce, which reduces their bargaining power and limits their share in the final consumer price. Price fluctuations, lack of real-time market information, and inadequate access to organized markets further exacerbate the problem. In addition, poor transportation infrastructure in hilly terrains increases marketing costs and reduces market efficiency. These constraints collectively hinder farmers from realizing fair and stable income from jackfruit cultivation. Although jackfruit has strong potential for value addition and export opportunities, there is a lack of institutional support, awareness, and investment in developing an integrated value chain. Farmer-producer organizations and cooperative marketing systems are not sufficiently developed to empower small and marginal farmers. In this context, there is a need for a comprehensive economic analysis of jackfruit cultivation and its marketing practices to identify cost structures, profitability levels, and inefficiencies in the supply chain. Addressing these issues is essential for improving farmer income, reducing post-harvest losses, and promoting jackfruit as a sustainable livelihood option in the region.

Scope of the Study

The present study focuses on analyzing the economic aspects of jackfruit cultivation and its marketing practices in the Kolli Hills of Namakkal District, Tamil Nadu. It covers key dimensions such as cost of cultivation, yield patterns, profitability, and benefit-cost analysis among small and marginal farmers. The study also examines existing marketing channels, price spread, and the role of intermediaries in determining farmers' income. Further, it explores the constraints related to production, post-harvest management, transportation, and market access. The scope extends to identifying opportunities for value addition, improved market linkages, and institutional support mechanisms such as farmer-producer organizations and cooperative marketing. However, the study is geographically limited to the Kolli Hills region and is based on primary data collected from selected farmers, which may restrict broader generalization. Despite these limitations, the study

provides valuable insights into enhancing the economic viability and sustainability of jackfruit cultivation in similar hilly and resource-constrained regions.

IV.METHODOLOGY

The present study adopts a descriptive and analytical research design to examine the economic aspects of jackfruit cultivation and marketing in the Kolli Hills of Namakkal District, Tamil Nadu. The study is primarily based on primary data collected from farmers engaged in jackfruit cultivation. A well-structured and pre-tested interview schedule was used to gather relevant information on cost of cultivation, yield, income, and marketing practices. Secondary data were also collected from government reports, journals, and institutional publications to support the analysis. A multi-stage sampling technique was employed for the selection of respondents. In the first stage, Namakkal District was purposively selected due to its prominence in jackfruit cultivation. In the second stage, Kolli Hills was chosen based on its geographical suitability and concentration of jackfruit growers. In the third stage, selected villages within Kolli Hills were identified using stratified sampling based on the extent of cultivation. Finally, 316 jackfruit farmers were selected using simple random sampling to ensure representativeness and reduce selection bias.

For data analysis, both descriptive and inferential statistical tools were used. Cost and return analysis, including the Benefit–Cost Ratio (BCR), was applied to evaluate the economic viability of jackfruit cultivation. Percentage analysis and mean values were used to describe the socio-economic characteristics and cost components. To examine relationships and test hypotheses, correlation analysis and multiple regression analysis were employed to identify the factors influencing profitability. Additionally, ANOVA (Analysis of Variance) was used to test differences in income levels across different categories of farmers. The statistical significance of the results was tested at appropriate levels (1% and 5%). The analysis was carried out using statistical software to ensure accuracy and reliability of the findings.

V.DATA ANALYSIS AND INTERPRETATION

Table 1: Distribution of Respondents by Farm Size

Farm Size Category	Number of Respondents	Percentage (%)
Marginal (<1 ha)	142	44.94
Small (1–2 ha)	108	34.18
Medium (2–4 ha)	46	14.56
Large (>4 ha)	20	6.32
Total	316	100

The distribution shows that a majority (79.12%) of jackfruit farmers belong to marginal and small categories, indicating that cultivation is predominantly practiced by resource-constrained farmers. This highlights the importance of jackfruit as a livelihood-supporting crop in the region.

Table 2: Average Cost of Jackfruit Cultivation per Acre (₹)

Cost Component	Amount (₹)	Percentage (%)
Labour Cost	18,500	37.00
Transportation	12,000	24.00
Fertilizers & Inputs	8,500	17.00
Maintenance	6,000	12.00
Miscellaneous	5,000	10.00
Total Cost	50,000	100

The table indicates that labour cost constitutes the highest share (37%), followed by transportation (24%). This reflects the challenges posed by hilly terrain, increasing operational costs and affecting overall profitability.

Table 3: Returns and Benefit–Cost Ratio

Particulars	Value (₹)
Average Yield (fruits/acre)	6,500
Average Selling Price (₹/fruit)	12
Gross Income	78,000
Total Cost	50,000

Net Income	28,000
BCR	1.56

The data indicates that jackfruit cultivation generates a gross income of ₹78,000 per acre against a total cost of ₹50,000, resulting in a net income of ₹28,000. The average yield of 6,500 fruits per acre, combined with a selling price of ₹12 per fruit, reflects stable production and market demand. The Benefit–Cost Ratio (1.56) confirms that the enterprise is economically viable and yields positive returns. However, the margin of profit suggests moderate earnings, indicating scope for improvement through better pricing and cost reduction. Overall, the findings highlight that while jackfruit cultivation ensures income stability, enhancing productivity and market efficiency can further increase profitability.

Table 4: Marketing Channels Used by Farmers

Marketing Channel	Respondents	Percentage (%)
Direct Sale to Consumers	52	16.46
Through Local Traders	138	43.67
Wholesalers	96	30.38
Retailers	30	9.49
Total	316	100

The distribution of marketing channels shows that a majority of farmers (43.67%) depend on local traders, followed by wholesalers (30.38%), indicating a strong reliance on intermediary-driven marketing systems. Only 16.46% of farmers engage in direct sales to consumers, reflecting limited access to alternative marketing avenues. The relatively low participation in retail-level sales (9.49%) further highlights weak market integration at the farmer level. This pattern suggests that most farmers have restricted bargaining power and limited price realization due to dependency on middlemen. It underscores the need to promote direct and collective marketing strategies to improve income and market efficiency.

Table 5: Price Spread in Marketing Channels (₹ per Fruit)

Participant	Price (₹)
Farmer Price	12

Trader Price	18
Wholesaler Price	24
Retailer Price	32
Consumer Price	35

The price spread clearly indicates a substantial increase in price at each stage of the marketing chain, rising from ₹12 at the farmer level to ₹35 at the consumer level. This shows that farmers receive only about 34% of the final consumer price, while intermediaries capture a significant share of the value. The largest margins are observed at the wholesaler and retailer levels, reflecting their control over distribution and market access. This structure highlights inefficiencies and unequal value distribution within the supply chain. It suggests that reducing intermediary involvement or strengthening direct marketing channels can significantly improve farmers' income.

Table 6: Regression Results (Factors Influencing Income)

Variable	Coefficient	Significance
Farm Size	0.42	Significant (5%)
Yield	0.55	Significant (1%)
Transportation Cost	-0.31	Significant (5%)
Market Access	0.47	Significant (1%)
Value Addition	0.39	Significant (5%)

The regression results indicate that farm size, yield, market access, and value addition have a positive and statistically significant influence on farmers' income, while transportation cost has a negative impact. Among these, yield (0.55) and market access (0.47) are highly significant at the 1% level, showing they are the most influential determinants of income. The positive coefficient of farm size (0.42) suggests that larger landholdings contribute to higher earnings. Value addition (0.39) also enhances income by increasing product value. In contrast, the negative coefficient of transportation cost (-0.31) highlights that higher logistics expenses reduce overall profitability.

Table 7: ANOVA Results (Income Across Marketing Methods)

Source of Variation	F-Value	Significance
Between Groups	5.87	Significant (5%)
Within Groups	—	—

The ANOVA results show that the F-value of 5.87 is statistically significant at the 5% level, indicating a meaningful difference in income among the groups studied. This confirms that variations in income are not due to random chance but are influenced by underlying factors such as marketing channels. The significant between-group variation suggests that certain groups of farmers perform better economically than others. In contrast, the within- group variation is comparatively low, indicating consistency within each group. Overall, the findings highlight the impact of structural factors on income disparities among farmers.

VI.DISCUSSION

The findings of the study provide a comprehensive understanding of the economic structure of jackfruit cultivation in the Kolli Hills region. The predominance of marginal and small farmers indicates that jackfruit cultivation is largely practiced as a livelihood-supporting activity rather than a fully commercial enterprise. This structural characteristic limit economy of scale and restricts the adoption of advanced technologies and modern farming practices. However, the widespread participation of smallholders also highlights the crop's adaptability and suitability for resource-constrained farmers. The dependency on small landholdings further implies vulnerability to income fluctuations and external shocks. Despite these limitations, jackfruit cultivation continues to play a crucial role in sustaining rural livelihoods. The findings align with earlier studies emphasizing the importance of horticultural crops in supporting smallholder economies. The demographic distribution also suggests the need for inclusive agricultural policies targeting small and marginal farmers. Enhancing access to inputs, credit, and extension services can significantly improve productivity. The results underscore the importance of strengthening institutional support systems. Overall, the structural composition of farmers forms the foundation for understanding economic outcomes in the region.

The cost analysis highlights that labour and transportation are the most significant components of total cultivation cost, reflecting the geographical challenges of the hilly terrain. High labour dependency indicates limited mechanization and reliance on traditional farming practices. Transportation costs are elevated due to poor infrastructure and difficult accessibility to markets. These factors collectively reduce the overall profitability of jackfruit cultivation. Although input costs such as fertilizers and maintenance are relatively lower, the high share of operational costs limits net income margins. This suggests that cost efficiency improvements are essential for enhancing farmer returns. Infrastructure development, especially road connectivity, can significantly reduce transportation expenses. The findings emphasize the importance of government intervention in improving rural infrastructure. Adoption of improved farming techniques can also reduce labour intensity. Efficient resource utilization is critical for sustaining profitability. The cost structure clearly indicates areas where policy and technological interventions can make a meaningful impact. The profitability analysis reveals that jackfruit cultivation is economically viable, as indicated by a favorable Benefit–Cost Ratio of 1.56. The positive net income demonstrates that farmers are able to generate returns above their investment. However, the moderate level of profitability suggests that there is considerable scope for improvement. Yield levels and market prices play a crucial role in determining income, and variations in these factors can significantly affect returns. The relatively stable yield indicates resilience of the crop under local conditions. However, price fluctuations and lack of storage facilities force farmers to sell at lower prices during peak seasons. This reduces their overall income potential. Enhancing productivity through improved agricultural practices can further increase profitability. Similarly, better market access and price stabilization mechanisms can improve income consistency. The results highlight the need for a balanced approach combining production and marketing improvements. Strengthening value chains can enhance overall economic efficiency. The marketing analysis reveals a strong dependence on intermediaries, which significantly affects farmers' income and bargaining power. The majority of farmers rely on local traders and wholesalers, limiting their ability to access better markets. The low percentage of

direct marketing indicates lack of infrastructure and institutional support for alternative marketing channels. The price spread analysis further confirms that intermediaries capture a substantial share of the final consumer price. This unequal distribution of value highlights inefficiencies within the supply chain. Farmers receive only a small portion of the consumer price, reducing their overall profitability. The findings emphasize the importance of reducing intermediary dominance in the marketing system. Promoting farmer-producer organizations and cooperative marketing can improve price realization. Direct marketing platforms can empower farmers and enhance income. Improved market information systems can also strengthen bargaining power. Overall, the marketing structure requires significant reforms to ensure equitable value distribution.

The regression and ANOVA results provide strong statistical support for the study's findings on income determinants and disparities. Yield and market access emerge as the most significant factors influencing income, highlighting the importance of productivity and connectivity. Farm size and value addition also positively contribute to income, indicating the benefits of scale and diversification. In contrast, transportation cost negatively impacts profitability, reinforcing the need for infrastructure development. The ANOVA results confirm significant differences in income across marketing channels, emphasizing the role of marketing strategies in determining economic outcomes. Farmers engaged in direct marketing achieve better income levels compared to those dependent on intermediaries. These findings highlight structural inequalities within the agricultural system. Policy interventions should focus on improving market access, reducing costs, and promoting value addition. Strengthening institutional mechanisms can address these disparities. The statistical evidence provides a strong foundation for recommending targeted interventions. Overall, the study underscores the need for an integrated approach to enhance farmer income and sustainability.

VII.CONCLUSION

The study concludes that jackfruit cultivation in the Kolli Hills of Namakkal District is a viable and sustainable agricultural activity, particularly for small and marginal farmers who constitute the majority of

producers. The favorable Benefit–Cost Ratio and positive net income indicate that the crop provides a stable source of livelihood under existing agro-climatic conditions. Its low input requirements and adaptability to hilly terrain make it an ideal crop for resource-constrained farmers. However, the analysis also reveals that profitability remains moderate due to high labour and transportation costs, which are largely influenced by infrastructural limitations. The predominance of traditional farming practices further restricts productivity enhancement and income maximization. Although yield levels are relatively stable, there is considerable scope for improvement through better agronomic practices and technological adoption. The study highlights that economic gains from cultivation alone are not sufficient unless supported by efficient marketing systems. Therefore, enhancing both production efficiency and cost management is essential for improving overall farm income. The findings reinforce the importance of targeted policy support for smallholders in horticulture. Strengthening extension services, improving access to inputs, and facilitating credit availability can play a crucial role in this regard. Overall, jackfruit cultivation holds strong potential as a climate- resilient and income-generating crop in hilly regions.

Furthermore, the study emphasizes that the existing marketing structure poses a significant constraint to realizing the full economic potential of jackfruit cultivation. The heavy reliance on intermediaries results in reduced price realization for farmers, as evidenced by the wide price spread between farm gate and consumer levels. Limited participation in direct marketing channels highlights the lack of market access, infrastructure, and institutional support. The statistical analysis confirms that factors such as yield, market access, and value addition significantly influence income, while high transportation costs adversely affect profitability. The significant variation in income across different marketing channels further underscores the importance of adopting efficient and farmer-centric marketing strategies. Promoting farmer-producer organizations, cooperative marketing, and direct selling platforms can enhance farmers' bargaining power and income share. Additionally, investment in value addition and processing units can create new income opportunities and reduce post-harvest losses. Improving rural

infrastructure, especially transportation and storage facilities, is critical for strengthening market linkages. The study suggests that an integrated approach combining production, marketing, and institutional reforms is necessary for sustainable development. Such interventions can ensure equitable value distribution and long-term income stability for farmers. In conclusion, unlocking the full potential of jackfruit cultivation requires coordinated efforts from policymakers, institutions, and farmers alike.

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