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A comprehensive assessment of constraints and strategic suggestions from cradle to grave across the paddy value chain

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ABSTRACT

Paddy is an important agricultural commodity supporting a diverse value chain involving farmers, traders and processing units engaged in the production and marketing of rice, parboiled rice, flaked rice and puffed rice. The present study was undertaken to document the major constraints faced and suggestions offered by different actors in the paddy value chain of *Karnataka*. Primary data were collected from 160 paddy farmers, 110 traders and 55 paddy processing units during the agricultural year 2025–26 using a pre-tested structured interview schedule. Garrett's ranking technique was employed to identify and prioritize the constraints and suggestions reported by the respondents. The results revealed that labour shortage was the major constraint faced by paddy farmers, with a mean score of 68.72, followed by high cost of labour (64.85) and high cost of cultivation (61.38). Among traders, price fluctuation emerged as the most important constraint, with a mean score of 82.47, followed by delay in payment from buyers or traders (76.85) and shortage of labour and high labour wages (68.42). In the case of paddy processing units, high market competition was the major constraint (78.75), followed by high capital investment (75.08) and price volatility (74.55). The major suggestions offered by farmers were ensuring remunerative and stable prices for paddy (78.65), timely availability of quality seeds and inputs (72.48) and timely and adequate labour availability (65.37). Traders emphasized regular supply of quality products throughout the year (72.84), improved rural roads and reduced transportation and logistics costs (68.57) and provision of low-interest loans (64.32). Processing units suggested ensuring regular supply of good-quality paddy (76.85), facilitating low-interest loans for mill modernization (71.42) and improving road and transportation infrastructure (65.38). The findings indicate the need for coordinated interventions addressing production, labour, price, infrastructure, finance and raw material supply constraints to strengthen the paddy value chain.

Keywords: Paddy, Value chain, Constraints, Suggestions, Garrett's ranking technique, Value addition

1. Introduction

Cereals form the cornerstone of the global food economy, contributing substantially to dietary energy, food security, agricultural livelihoods and rural economic development. The food and nutritional security of a large proportion of the World's population depends on the availability of cereals. In developing countries, the contribution of cereals to the total dietary calories is 42 per cent, indicating its pivotal role in meeting basic food requirements (FAOSTAT, 2025). Cereals are cultivated extensively in the diverse agro-climatic conditions reaching 3.04 billion tons of production in 2025 at global level (FAOSTAT, 2026a). Among the major cereals, rice holds a distinctive position owing to its widespread cultivation, high consumption and significant contribution to food security, particularly in Asian countries, where it forms an integral part of the food system and rural economy.

Paddy (*Oryza sativa*) known as rice in its unhusked form is one of the important cereal crops in the World since it is widely consumed as the staple food by large portion of the world's human population. It plays a vital role in food security, nutrition, employment generation and rural livelihoods. The global paddy production is 867.00 million tons. Of which, 563.40 million tons is milled rice (FAOSTAT, 2026b). India is the world's largest producer of rice, with a production of 154.02 million tonnes, accounting for 28 per cent of global rice production, followed by China with 146 million tonnes (USDA, 2026) [1]. India is also the world's largest consumer of rice. In India, Uttar Pradesh ranks first in terms of area under paddy cultivation with 7.35 million hectares, followed by West Bengal (5.59 million ha) and Telangana (4.81 million ha). In terms of paddy production, Uttar Pradesh ranks first with 20.76 million tons, followed by Telangana (17.45 million tons), West Bengal (16.02 million tons), Punjab (14.36 million tons) and Chhattisgarh (10.37 million tons). With respect to productivity, Andhra Pradesh ranks first with 3.92 tons per hectare, followed by Telangana with 3.62 tons per hectare (Anonymous, 2024a) [2] and Karnataka Ranks 13th in total rice production (IndiaStat, 2025) [3]

Paddy being the staple food crop of *Karnataka* plays a vital role in food security, rural livelihood, and the state's agricultural economy. It was cultivated in an area of 9.29 lakh hectares with production of 30.47 lakh tons and productivity of 3,280 kg per hectare (IndiaStat, 2026) [4]. Within *Karnataka*, the major rice-producing districts are Raichur, with an area of 1.7 lakh ha and production of 6.83 lakh tons, followed by Yadgir (0.89 lakh ha and 3.17 lakh tons), Ballari (0.86 lakh ha and 3.93 lakh tonnes), Mysuru (0.84 lakh ha and 2.58 lakh tons) and Shivamogga (0.70 lakh ha and 1.79 lakh tons (Anonymous, 2022) [5].

Shivamogga district, situated in the Malnad region of *Karnataka*, possessed diverse agro-ecological conditions that are highly suitable for paddy cultivation. The district receives relatively higher rainfall compared to other parts in the state where paddy is cultivated and is endowed with abundant water resources from rivers, tanks and irrigation projects. Paddy is grown mostly in the kharif season under irrigated and rainfed conditions and during summer, it is grown under irrigated conditions. The area under paddy is decelerating in the entire state at the rate of 8.79 per cent in general and at 5.50 per cent in Shivamogga (Anonymous, 2024b; Anonymous, 2023) [6, 7]. This is really a cause of concern as it is the major staple food crop and main source of fodder for the livestock in the district. The prime reasons for the decline in the area would be the non-remunerative nature of the crop and the requirement of intense management compared to perennial crops like arecanut, which otherwise is highly lucrative requiring lesser management (Sahana *et al.*, 2021) [8].

Paddy value chain involves various actors including farmers, input suppliers, traders, processors, wholesalers, retailers, government agencies and consumers. Value is created through production, aggregation, processing, storage, transportation, marketing and distribution activities. The performance of these interconnected actors influences the costs incurred, value addition and returns generated at different stages of the chain. Despite the economic importance of the paddy value chain, the actors involved face several constraints that affect its efficient functioning. Farmers face problems related to labour availability and cost, cost of cultivation, weather conditions and dependence on intermediaries, while traders and processing units face constraints associated with price fluctuations, competition, capital requirements, infrastructure and raw material supply. Identification of such constraints and documentation of suggestions offered by the value chain actors are therefore essential for improving the functioning of the paddy value chain. Hence, the present study was undertaken to document the constraints faced and suggestions offered by value chain actors in the paddy value chain.

2. Materials and Methods

The present study was an ex-post facto research design conducted to document the constraints faced and suggestions offered by value chain actors in the paddy value chain of Shivamogga and Davangere districts of *Karnataka*. Shivamogga district was purposively selected as paddy cultivation has shown a transition and the district possesses a network of value addition units, while Davangere district was selected from the view point of assessment of value addition as it has a large number of processing units.

The study covered major value chain actors involved in the production, processing and marketing of paddy and its value-added products. The sample included 160 paddy farmers, along with 55 processing units and 110 marketing intermediaries (40 wholesalers, 40 retailers and 30 village traders) selected from the two districts. Rice mill owners, puffed rice unit owners, flaked rice unit owners, parboiled rice unit owners, rice flour unit owners, paddy hulling unit owners, wholesalers, village traders and retailers were selected as major value chain actors.

Primary data were collected from the selected value chain actors through personal interviews using a well-structured and pre-tested interview schedule. Information was collected from paddy farmers, processing units and marketing intermediaries involved in the produc-

tion, processing and marketing of paddy and its value-added products. For documenting constraints and suggestions, information was collected from all categories of respondents, including farmers, processors, village traders, wholesalers and retailers. Garrett's Ranking Technique was employed to identify and prioritize the constraints faced by the actors and suggestions offered by different stakeholders. Respondents were asked to rank the major production, processing and marketing constraints according to their severity. The ranks were converted into percentage positions and then into Garrett scores using Garrett's conversion table. The mean Garrett score for each constraint and suggestion was calculated and the items were arranged in descending order of their mean scores to identify the major constraints and suggestions of the value chain actors.

3. Results and Discussion

3.1 Constraints faced by sample paddy farmers

The major constraints faced by paddy farmers (Table 1) indicated that the acute scarcity of the labour was the severe constraint ranked I with the mean score of (68.72). Paddy being labour intensive crop demands both men and women labour for various operations. Though, seed to seed mechanization was available but still reliance of farmers on human labour is not relieved. Transplanting and weeding are the two operations which are still being practiced using human labour. It was followed by the rise in wages of human labour (64.85). Acute physical scarcity is reflected in rise of wages of human labour is termed as economic scarcity. Farmers in addition are facing the brunt of rising wages of human labour. The findings was in close conformity with Muthukumar *et al.* (2020) [9], who reported that labour shortage and high wages were the major constraints faced by paddy farmers in Tamil Nadu. The higher cost of cultivation was regarded as the third severe constraint (61.38). The prime reason for the rising cost of cultivation was the rise in wages of human labour, machine labour, rise in prices of fertilizers, imposition of taxes on agricultural inputs etc., Aberrant weather conditions was also regarded as the crucial problem affecting the cultivation of paddy especially under rainfed condition (58.64, IV). The delay in onset of monsoon, erratic distribution of rainfall, rising temperature etc. are the indicators of climate aberration. The dependence of farmers on middleman in marketing of paddy was regarded as another constraint (54.27, V). Farmers expressed the problem being faced in the regulated markets regarding quality issues. Village traders purchase lots without rising any objection regarding quality aspects and that to at farm gate. Lower yields were regarded as another problem in paddy cultivation (49.83, VI). The age-old varieties have shown decline in their yield performance because of their susceptibility to pest and disease incidence, lastly the incidence of pests and diseases was regarded as the minor constraint. Farmers in the recent past are facing the problem of pest and diseases because of climate aberration. The findings was consistent with the results of Kavyashree *et al.* (2021) [10], who reported that non availability of agricultural labours, pest and disease problem, unpredictable and irregularity of monsoon were the constraints faced by paddy farmers in Shivamogga district of *Karnataka*.

(*n* = 160)

Table 1. Constraints faced by sample paddy growing farmers

Constraints	Mean Score	Rank
Acute scarcity of labour	68.72	I
High wages of labour	64.85	II
High cost of cultivation	61.38	III
Aberrant weather conditions	58.64	IV
Dependence on middleman	54.27	V
Low yield of paddy	49.83	VI
Incidence of pests and diseases	46.92	VII

(continued on next page)

3.2 Constraints faced by the traders involved in the paddy value chain

The major constraints faced by traders in the paddy value chain (Table 2) included Price fluctuation (82.47). The variation in prices definitely poses problem on the part of those traders not having establishment. In the presence of establishment, they can reap benefit and in the absence, they may have to forego the opportunity. The delayed payment from the buyers or traders (76.85) was regarded as another serious constraint. The payment should have to be made to traders immediately after the transaction completes. Shortage of labour and high labour wages (68.42, III) was expressed as the severe constraint since they need labour force for performing loading and unloading activities. During peak period, their unavailability create enormous problem. High competition in the market (63.76, IV) was regarded as one of the serious constraint. It is known fact that processing adds better revenue. But the success of unit depends on how the unit is dealing with competition present in the external world. Poor road and transportation infrastructure was another problem coming in the way of smooth conduct of trade (58.64, V) since product is produced at one point and demanded at another point necessitating the requirement of transportation. Unscientific storage and handling practiced have paved a way for losses (44.28, VI). Difficulty in procuring required varieties (35.16, VII) were the other important constraints. The findings were in close agreement with the results of *Shahana et al. (2024) [11]*, who reported that price volatility, high labour wages, delay in payments, high transportation cost were the major constraints in the branded rice market in Kerala.

(*n* = 110)

Table 2. Constraints faced by traders in the paddy value chain

Constraints	Mean Score	Rank
Price fluctuation	82.47	I
Delay in payment from the buyers or traders	76.85	II
Shortage of labour and high labour wages	68.42	III
High competition in the market	63.76	IV
Poor road and transportation infrastructure	58.64	V
Storage and handling losses	44.28	VI
High transportation cost	40.31	VII
Difficulty in procuring preferred varieties	35.16	VIII

3.3 Constraints faced by paddy processing units

The major problems faced by paddy processing units (Table 3) included high market competition (78.75, I). The intense competition among processing units was regarded as the most severe problem, as processors have to compete in terms of product quality, price, branding and market reach. High capital investment (75.08, II) was another serious problem, as the establishment and modernization of processing units require substantial investment in machinery, buildings and other infrastructure, which creates financial pressure on the processors. Price volatility (74.55, III) was also considered as a major problem, as frequent fluctuations in the prices of paddy and processed products create uncertainty in procurement and marketing decisions and affect the profitability of the processing units. High maintenance cost of machinery (54.53, IV) was another important problem, as regular maintenance and repair of processing machinery increase the operating cost of the units. The findings was in close agreement with the results of *Kumar et al. (2024) [12]*, who reported that high capital investment, price volatility and high maintenance cost for machinery were the major constraints in the managerial issues faced by rice mills

in Jammu. Lack of timely supply of raw materials (49.68, V) affected the smooth and continuous operation of processing units due to irregular availability of paddy. Lack of skilled labour (47.45, VI) was also reported, particularly for operating and maintaining processing machinery efficiently. Low-quality grain (39.20, VII) affected the quality and recovery of processed products. Lack of consumer awareness about the brand (32.45, VIII) made it difficult for processors to establish their products and expand their market share. High procurement cost of paddy (20.78, IX) was ranked as the least important problem, although higher procurement prices increased the raw material cost and reduced the profit margins of processing units. The findings was consistent with the results of *Sharma et al. (2012) [13]*, who reported that high market competition, Low and untimely supply of raw materials and low-quality grain were the major constraints in paddy processing industry in northern India.

(*n* = 55)

Table 3. Constraints faced by Paddy processing units

Constraints	Mean Score	Rank
High market competition	78.75	I
High capital investment	75.08	II
Price volatility	74.55	III
High maintenance cost of machinery	54.53	IV
Lack of timely supply of raw materials	49.68	V
Lack of skilled labour	47.45	VI
Low-quality grain	39.2	VII
Lack of consumer awareness about the brand	32.45	VIII
High procurement cost of paddy	20.78	IX

3.4 Suggestions offered by sample paddy farmers

The major suggestion offered by the sample paddy growing farmers (Table 4) was to ensure remunerative prices for paddy (78.65, I). Stable and remunerative prices would provide better income security to farmers and encourage them to continue paddy cultivation. Ensuring timely availability of quality seeds and inputs (72.48, II) was another important suggestion, as the timely availability of quality inputs helps farmers maintain crop productivity and reduce production risks. This finding is in close agreement with the results of *Shelar et al. (2021) [14]*, who emphasized the need for timely and subsidized farm inputs as an important measure for reducing production risks. Providing timely and adequate machine labour (65.37, III) was also suggested, as machine labour is required for various cultivation operations and its shortage, particularly during peak periods, affects timely completion of farm activities. Speedy claim settlement under crop insurance (59.82, IV) was considered important to protect farmers against crop losses arising from adverse weather conditions, pests and other production risks. Improving access to government procurement (54.76, V) was suggested to ensure remunerative price realization and reduce dependence on private buyers. Improvement in marketing facilities (50.25, VI) was also suggested to provide better market access and reduce difficulties in selling paddy. Providing effective control measures for insects and pests (49.63, VII) was suggested to minimize crop losses and improve productivity. Improving rural roads and transportation facilities (43.85, VII) was also suggested to facilitate the timely movement of paddy from farms to markets and reduce transportation difficulties. The results were in agreement with the results of *Kavyashree et al. (2021) [10]*, who reported that enhancement of MSP for paddy at regular intervals, creation of awareness in farmers on crop insurance schemes and developing disease or pest-resistant varieties were the major suggestions offered by paddy farmers in Shivamogga district of Karnataka.

(n = 160)

Table 4. Suggestions offered by sample paddy growing farmers

Suggestions	Mean Score	Rank
Ensuring remunerative prices for paddy	78.65	I
Ensuring timely availability of quality seeds and inputs	72.48	II
Provision of timely and adequate machine labour	65.37	III
Speedy claim settlement under crop insurance	59.82	IV
Improved access to government procurement	54.76	V
Improvement in marketing facilities	50.25	VI
Provision of effective control measures for insects and pests	49.63	VII
Improvement of rural roads and transportation facilities	43.85	VIII

3.5 Suggestions offered by traders in the paddy value chain

The major suggestion offered by the middlemen in the paddy value chain (Table 5) was to ensure regular supply of quality raw materials throughout the year (72.84, I). Regular availability of quality products would help middlemen to meet the requirements of buyers and maintain continuity in their business operations. Improving rural roads and reducing transportation and logistics costs (68.57, II) was another important suggestion, as better connectivity and lower transportation costs would facilitate smooth movement of paddy and rice products and improve the efficiency of marketing operations. Providing low-interest loans (64.32, III) was also suggested, as affordable credit would help middlemen to meet their working capital requirements and expand their trading activities. Reducing market fees and transaction costs (58.76, IV) was considered important to reduce the overall cost of marketing and improve the returns from trading activities. Improving packaging and labelling standards (51.43, V) was suggested to enhance product presentation, maintain quality during handling and improve market acceptance. Increasing consumer awareness about quality rice products (45.68, VI) was also suggested, as greater consumer awareness would help increase demand for quality products and create better market opportunities for middlemen.

(n = 110)

Table 5. Suggestions offered by middlemen in the paddy value chain

Suggestions	Mean Score	Rank
Ensuring regular supply of quality products throughout the year	72.84	I
Improvement of the rural roads for reducing transportation and logistics costs	68.57	II
Provision of low-interest loans	64.32	III
Reduction in market fees and transaction costs	58.76	IV
Improvement of packaging and labelling standards	51.43	V
Increasing consumer awareness about quality rice products	45.68	VI

3.6 Suggestions offered by paddy processing units

The major suggestion offered by the paddy processing units (Table 6) was to ensure a regular supply of good-quality paddy (76.85, I). Regular availability of quality paddy would help the units to maintain continuous processing operations and ensure better quality and recovery of processed products. Facilitating low-interest loans for mill modernization (71.42, II) was another important suggestion, as concessional credit would enable processing units to upgrade machinery, improve processing efficiency and reduce operational difficulties.

Improving road and transportation infrastructure (65.38, III) was also suggested, as better transportation facilities would facilitate the timely movement of paddy and processed products and reduce logistics costs. Encouraging adoption of modern milling technologies (61.74, IV) was suggested to improve processing efficiency, reduce wastage and enhance the quality of rice and other processed products. Strengthening export promotion and market linkages (56.29, V) was considered important to provide wider market opportunities and improve the marketability of processed products. Providing timely availability of skilled labour (51.63, VI) was suggested to ensure efficient operation and maintenance of modern processing machinery. Simplifying licensing, regulatory and certification procedures (47.85, VII) was also suggested to reduce procedural difficulties and facilitate the smooth establishment and operation of paddy processing units.

(n = 40)

Table 25. Suggestions offered by paddy processing units

Suggestions	Mean Score	Rank
Ensuring regular supply of good-quality paddy	76.85	I
Facilitating low-interest loans for mill modernization	71.42	II
Improvement of road and transportation infrastructure	65.38	III
Encouraging adoption of modern milling technologies	61.74	IV
Strengthening of export promotion and market linkages	56.29	V
Simplify licensing, regulatory and certification procedures	47.85	VI

4. Conclusion

The study revealed that paddy value chain actors faced diverse production, marketing and processing-related constraints. Among farmers, acute scarcity of labour emerged as the major constraint, followed by high wages of labour and high cost of cultivation. Traders mainly faced price fluctuation, delay in payment and shortage of labour and high labour wages, while processing units were constrained by high market competition, high capital investment and price volatility. The major suggestions offered by farmers included ensuring remunerative prices, timely availability of quality seeds and inputs, and adequate machine labour. Traders emphasized regular supply of quality products, improved rural roads and reduced transportation costs, and low-interest loans. Processing units suggested regular supply of good-quality paddy, low-interest loans for mill modernization and improved transportation infrastructure. Overall, addressing labour, price, finance, infrastructure, raw material supply and market-related constraints is essential for improving the functioning of the paddy value chain.

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