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Review Paper

Rice Value Chain Systems in Haryana: An Economic Analysis

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ABSTRACT

The economic analysis of rice value chain in Haryana has been carried out using a sample of 30 farmers, 10 wholesalers and 20 retailers which were purposively selected from Karnal district of Haryana. One government (HAFED Taraori rice mill) and 5 private rice mills in Karnal were selected as the processing units. The results revealed that retailers incurred the highest total cost in both Basmati and non-basmati (PR-fine) rice value chain (₹ 93.37 kg^{-1} and 41.73kg^{-1}), whereas rice mills contributed the largest value addition to both Basmati and PR-fine rice (61.34% and 56.19%). The highest profit in Basmati rice and PR-fine rice was accrued by rice mills (₹ 37.96 kg^{-1} and ₹ 8.88 kg^{-1}). The major production and processing constraints were lack of remunerative prices and market instability with Garrett mean score of 76.33 and 63.71, respectively, while the major wholesaling and retailing constraints was increased procurement cost as a result of per litre increased cost of fuel. Better remunerative price policy for paddy should be made to entice farmers to produce more and ensure regular supply of paddy to the processing units, which will trickle down to the entire value chain.

HIGHLIGHTS

- Highest total cost in the value chain was incurred by retailers (₹ 93.37 kg^{-1} and ₹ 41.73 kg^{-1} Basmati and non-basmati rice, respectively).
- Highest total value addition was done by rice mills (61.34% to Basmati rice and 56.19% to non-basmati rice).
- Highest net profit was accrued by rice mills in the value chain (₹ 37.96 kg^{-1} for Basmati and ₹ 8.88 kg^{-1} for non-basmati).

Keywords: Value chain, Rice, profit share, Haryana

Rice is the most consumed staple in Asian and African and provides 80 per cent of food caloric requirement to human being. Rice cultivation spreads across all continents and in a wide range of locations, a variety of climatic conditions, from the wettest areas of the world to the driest deserts (Maclean *et al*. 2002). Globally, an estimated area of 167 million ha is cultivated for rice, producing more than 755 million tonnes worldwide in 2020 (USDA, 2020). Rice production is dominated by Asia, producing about 90 per cent of world rice in 2020. Rice delivers 20 percent of the world's dietary energy supply, while wheat and maize supplies 19 and 5 per cent respectively (Alexandratos and Jelle, 2012). Rice and wheat contribute about 30 per cent of global calorie intake making them the predominant source of nutrition for billions of people around the world (Anwesha *et al*. 2020).

The world's largest rice producers by far are China and India. The two nations had a combine total production of 387.26 million tonnes of rice in 2019-20, representing over 40 per cent of global rice

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production (USDA, 2020). The next largest rice producers were Indonesia 54.60 million tonnes (9.73%), Bangladesh 55.59 million tonnes (6.83%), Vietnam 43.45 million tonnes (5.30%), Thailand 28.36 million tonnes (4.22%), Myanmar 26.27 million tonnes (3.71%), Philippines 18.81 million tonnes (3.19%), Pakistan 11.12 million tonnes (2.55%) and Cambodia 10.89 million tonnes (2.48%) (USDA, 2020).

India is the second largest producer of rice in the world after China. In 2019-20, an estimated area of 43.79 million hectare was devoted to rice, which led to the total output of 118.43 million tonnes (Agricultural statistics at a glance, 2020). India is blessed with diverse agro-ecological conditions, making it suitable for the cultivation of various crops, including rice, and ensuring food and nutritional security for the teeming population through steady production and distribution. The progress recorded in Indian economy is in part because of Haryana, which is among the leading producers of rice in the country and a major contributor to the national food grain stock, in addition to 60 per cent of total basmati rice export from India. Thus, the importance of Haryana in the Indian economy calls for the need for improvement on the present structure of rice value chain.

Despite numerous research commitments on value chain of rice and other important food grains in the study area, limited attention was focused on identifying the functioning and efficiency of rice value chains. The value chain model presumes that by understanding the interlinkage within the chain, it is feasible for private and public agencies to identify points of intervention in order to increase the efficiency by increasing total generated value as well as increase the productivity of value chain actors. Understanding the operating mechanism within the value chain system will help in distinguishing bottlenecks and failures that will allow for intervention and improvement possibilities within the system (Mustapha, 2017).

This study intends to examine the economics of rice value chain in India, particularly focussing on Haryana state. The study will be relevant to stakeholders at all levels, particularly agricultural development planners and policy makers, farmers, processors, marketers and exporters. The study will further be useful to researchers, extension functionaries and also serve as a basis for further research in this area.

Status of rice scenario in India and Haryana

While India remains the second largest producer of rice in the world after China with an estimated production of 118.43 million tonnes in 2019-20, Haryana has continued to contribute immensely to the economic development of India, especially in terms of rice production. Highest area allocation to rice in India was of 44.71 million ha observed in 2000-01, while highest production and yield of 118.43 million tonnes and 2705 kg ha^{-1}, respectively was recorded in 2019-20. In contrast, highest area allocation of 1.45 million ha was recorded in 2018-19 and 2019-20, while highest production and yield of 4.88 million tonnes and 3422 kg ha^{-1}, respectively was recorded in 2019-20. Furthermore, the percentage rice area and production share of Haryana to all India during the period 2000-01 to 2019-20 has been fairly inconsistent with observed increase from 2.48 per cent and 3.88 per cent to 3.31 per cent and 4.07 per cent from in 2000-01 to 2019-20.

MATERIALS AND METHODS

Study area and sampling method

The study was conducted in Karnal district of Haryana using multistage sampling techniques. A sample of 30 farmers, 10 wholesalers and 20 retailers were purposively selected from various villages in Nilokheri block of Karnal district of Haryana with the help of primary survey technique. Furthermore, twenty-year time series data from the period 2000-01 to 2019-20 related to area, production and yield was also used to complement the primary data. Likewise, five private rice mills and Haryana State Co-operative Supply and Marketing Federation Limited (HAFED) rice mill in Taraori (Karnal) were chosen as the processing mills.

Data analysis

The data for the present study was analysed using the following techniques:

Value chain mapping: the rice value chain was mapped out using the net map tool-box analysis, in which the rice value chain was identified while

explaining the functions and performances of the value chain actors. It provides a graphical representation of paddy as it moves from producers to the consumers, passing through different stages, with value added at each stage before it reaches its final point of consumption.

Value added: value addition difference between selling price of a product or service less the cost of producing the product or service (Kohls and Uhl, 1967). It is mathematically expressed as:

$$VA = Selling - Total\ marketing\ cost \quad \ldots (1)$$

Net returns: Net returns is the revenue received from an investment after all costs are paid off. It is the gross returns less total cost (Acharya and Agarwal, 2006). It is calculated as:

$$Net\ returns = Gross\ returns - total\ cost \quad \ldots (2)$$

Garrett mean score ranking: The method is widely used by many researchers due to its ability to rank constraints in order of importance. Accordingly, constraints were arranged in order of importance and ranked by respondents in order of priority from the most important to the least important (Zalkuwi *et al.* 2015). The order of the constraints as given by the respondents were converted to percent position using the formula below:

$$Percent\ position = \frac{100\left(R_{ij} - 0.5\right)}{N_i} \quad \ldots (3)$$

Where:

R_{ij} = rank given for the i^{th} constraint by the j^{th} respondent

N_i = Number of constraints ranked by the j^{th} respondent

RESULTS AND DISCUSSION

Rice Scenario in India and Haryana

India is the second largest producer of rice in the world after China with an estimated production of 118.43 million tonnes in 2019-20. Similarly, Haryana is an important state to the economic development of India, especially in terms of rice production. In 2019-20, Haryana recorded a total rice output of 4.82 million tonnes. The extraordinary growth in rice in Haryana and India at large is credited to the adoption of improved agronomic practices, expanded irrigation facilities and evolution of potential cultivars. Table 1 presents the area, production and yield of rice in India and Haryana from the year 2000-01 to 2019-20.

In India, the highest area allocation to rice (44.90 million ha) was recorded in 2001-02. Despite covid-19 challenges, the year 2019-20 witnessed the highest production and yield which were found to be 118.43 million tonnes and 2,705 kg $ha^{-1,}$ respectively. In contrast, highest area allocation of 1.45 million ha was recorded in 2018-19 and 2019-20, while record high 4.88 million tonnes and 3,422 kg ha^{-1} were recorded in 2017-18 in Haryana.

The percentage rice area and production share of Haryana to all India during the period 2000-01 to 2019-20 has been fairly inconsistent. Area and production share of rice to all India has increased from 2.48 per cent and 3.88 per cent in 2000-01 to 3.31 per cent and 4.07 per cent in 2019-20. The minimum and maximum share of area was found to be 2.22 per cent in 2002-03 and 3.87 in 2009-10. Similarly, the lowest share of Haryana to all India was found to be 3.33 per cent in 2008-09, while 2009-10 and 2019-20 were tied for the highest share of 4.07 per cent.

Mapping of rice value chain

The rice value chain map as depicted through a flowchart (Fig. 1) provides a graphical representation of paddy as it moves from producers to the consumers, passing through different stages and stakeholders, with value-added at each stage before it reaches its final point of consumption. The major activities in the value chain included input supply, production, trading, marketing/processing and consumption. Similar value chain was reported by Karuni (2013) with demand and supply imbalance, changing consumer preferences and income growth were cited as the additional reason for the value chain approach.

Actors and their functions in the value chain

The major actors and the functions they perform in the value chain includes: (a) provision of extension services to the farmers by government through the

Table 1: Paddy area, production and yield in India and Haryana: 2000-01 to 2019-20

	India			Haryana		
Periods	**Area (million ha)**	**Production (million tonnes)**	**Yield (kg/ha)**	**Area (million ha)**	**Production (million tonnes)**	**Yield (kg/ha)**
2000-01	44.71	84.98	1901	1.05 (2.48)	2.70 (3.88)	2,557
2001-02	44.90	93.34	2079	1.03 (2.31)	2.73 (4.04)	2,650
2002-03	41.18	71.82	1744	0.91 (2.22)	2.47 (3.44)	2,417
2003-04	42.59	88.53	2079	1.02 (2.30)	2.79 (3.49)	2,735
2004-05	41.91	83.13	1984	1.03 (2.46)	3.02 (3.63)	2,941
2005-06	43.66	91.79	2102	1.05 (2.40)	3.19 (3.50)	3,051
2006-07	43.81	93.36	2131	1.04 (2.37)	3.38 (3.61)	3,228
2007-08	43.91	96.69	2202	1.07 (2.46)	3.61 (3.73)	3,361
2008-09	45.54	99.18	2178	1.21 (2.66)	3.30 (3.33)	2,726
2009-10	41.92	89.09	2125	1.21 (3.87)	3.63 (4.07)	3,008
2010-11	42.86	95.98	2239	1.24 (2.79)	3.47 (3.44)	2,788
2011-12	44.01	105.30	2393	1.23 (2.74)	3.76 (3.81)	3,044
2012-13	42.75	105.23	2461	1.21 (2.84)	3.94 (3.78)	3,268
2013-14	44.14	106.65	2416	1.24 (2.78)	4.03 (3.75)	3,248
2014-15	44.11	105.48	2391	1.28 (2.93)	4.01 (3.82)	3,113
2015-16	43.50	104.41	2400	1.35 (3.11)	4.14 (3.97)	3,061
2016-17	43.19	109.70	2494	1.39 (3.21)	4.45 (4.04)	3,213
2017-18	43.77	112.76	2576	1.42 (3.25)	4.88 (4.01)	3,422
2018-19	44.16	116.48	2,638	1.45 (3.30)	4.52 (3.88)	3,121
2019-20	43.79	118.43	2,705	1.45 (3.31)	4.82 (4.07)	3,334

Source: *Indiastat for India, (GOI) and Statistical Abstract of Haryana (GoH).*

**Figures in parenthesis indicates percentage share to All India.*

Krishi Vigyan Vendra (KVK) system, (b) provision of production credit by credit / financial institutions (commercial banks, cooperative banks, development banks and in some cases money lenders), (c) input suppliers who provide the production inputs like seeds, fertilizers, and agrochemicals, (d) producers (farmers) who are the primary producers (e) commission agents who facilitate the buying and selling of the produce for a commission, (f) processing firms / rice mills which purchase paddy in bulk and process it into finished or readily consumed products, and the wholesalers and retailers who perform the distribution function of selling the rice to consumers. Government plays a regulatory role by setting up policies within which all the participants have to operate.

Paddy milling process

Processing of paddy involves a series of processes through which paddy is converted into milled or parboiled rice. Most mills produce both parboiled and white (raw) rice using separate production lines. The processes involved in rice milling include:

(i) Paddy preparation involves the removal of contaminants such as rice straw, dust, stones and sand are removed from the paddy using an air blower and a series of vibrating screens.

(ii) Steaming/parboiling, a process by which the paddy is passed through hot steam with the aid of increasing the strength of the grain and reducing the breakability of the grain during milling.

(iii) Drying: The steamed paddy is dried by a continuous process in mechanical dryers using hot air. Steamed paddy with around 30-45% moisture content is first transferred to dryer where moisture is reduced to 22%. The hot air is generated in a steam-based heat exchanger with automatic temperature controller to maintain hot air temperature to around 700°C. Partially dried paddy is then transferred to a second dryer for final moisture reduction to the level of 10-14%.

(iv) Milling: This stage involves de-husking, separation, cone polishing, separation and

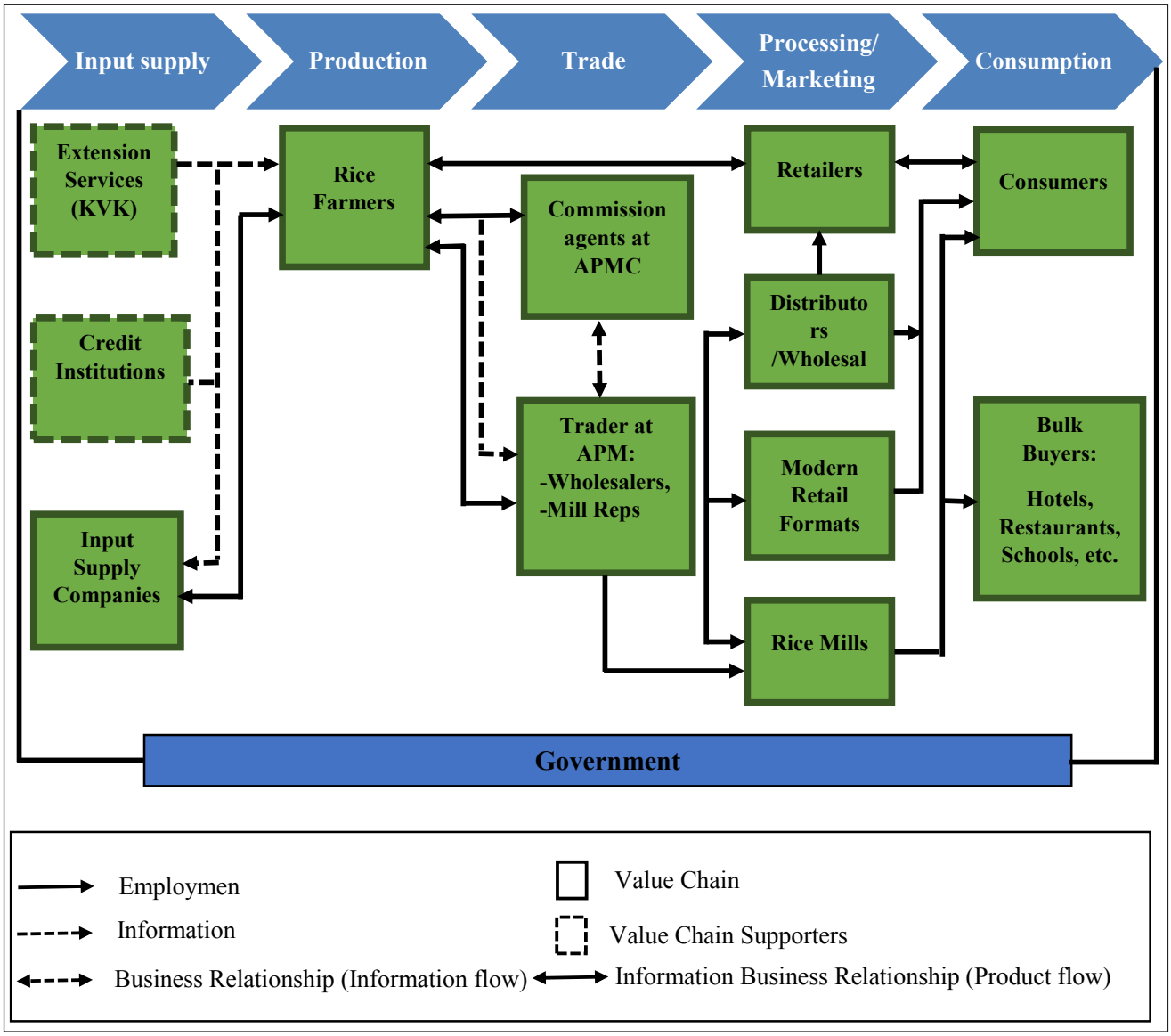

Fig. 1: Rice value chain map

grading, silky polishing, etc., depending on the existing facilities in the rice mill, before it is transferred to a bagging yard for packing of the final polished rice.

(v) Destoning: This is a pre-cleaning process through which contaminants carried over along with the paddy such as stones are removed through vibrating sieves.

(vi) De-husking: This refers to removal of husk from the paddy resulting to the production of brown rice. The husk is an important by-product used as fuel in the boiler for steam generation, while bran which accounts for about 8% by weight of paddy is sold to oils mills for the production of rice bran oil.

(vii) Whitening and polishing: The brown rice obtained from de-husking has a brown layer called bran. The bran is removed from the brown rice through whitening and polishing to produce white rice. The bran is very rich in protein and is sold as a by-product for the production of rice bran oil and poultry feed.

Performance of rice value chain actors

The performance of the major actors of rice value chain indicated the effort made by each actor in adding value to the commodity before it reaches the end user. In the process, financial commitments were made in the form of production costs, purchase cost, marketing cost and transportation cost. It also

indicated the percentage share of consumers rupee that was benefited by each actor.

Distribution of cost and profit among actors of Basmati rice value chain

The distribution of cost and profit share among the actors of Basmati rice was presented in Table 2. According to the result, retailers incurred the highest total cost among all actors, which was ₹ 93.37 kg^{-1}, representing 38.90 per cent of the total cost, followed by wholesalers ₹ 80.64 kg^{-1} (33.59%) and the rice mills ₹ 38.88 kg^{-1} (16.20%). Farmers incurred the least total cost of ₹ 27.17 kg^{-1} (11.32%).

Results of the total valued added to Basmati rice revealed that rice mills added the highest value to the product (61.34%), followed by wholesalers (17.13%) and retailers (14.90%). Farmers added the least value to the product (6.62%). Furthermore, the rice mill benefited the highest share of net profit which was recorded at ₹ 37.96 kg^{-1} (63.62%), followed by wholesalers, ₹ 9.23 kg^{-1} (15.47%) and the retailers, ₹ 7.83 kg^{-1} (13.13%). Farmers recorded the least share of net profit from consumers' rupee, ₹ 4.65 kg^{-1} (7.79%). Similar findings were reported by Pavithra, *et al*. (2018).

Distribution of cost and profit among actors of PR-fine rice value chain

The distribution of cost and profit share among the actors of PR-fine rice was presented in Table 3. According to the result, retailers incurred the highest total cost among all actors which was ₹ 41.73 kg^{-1}, representing 35.27 per cent of the total cost, followed by wholesalers ₹ 36.44 kg^{-1} (30.80%) and

Table 2: Extent of cost and profit among actors of Basmati rice (₹.kg^{-1})

Farmers	Producers	Rice mills	Wholesalers	Retailers	Horizontal sum
Purchase price	—	30.19	76.84	89.87	196.90
Production cost	26.78	—	—	—	26.78
Processing cost	—	4.70	—	—	4.70
Loading / Unloading cost	—	0.12	0.30	—	0.42
Transportation cost	0.39	1.38	2.00	2.33	6.10
Cost of packaging material	—	1.48	—	0.00	1.48
Rent on market shop / space	—	—	1.50	1.17	2.67
Tax	—	1.00	—	—	1.00
Total marketing cost	0.39	8.68	3.80	3.50	16.37
Total cost	27.17 (11.32)	38.88 (16.20)	80.64 (33.59)	93.37 (38.90)	240.05 (100.00)
Sale price	31.81	76.84	89.87	101.20	229.72
Value added	5.04 (6.62)	46.64 (61.34)	13.03 (17.13)	14.90 (7.83)	76.04 (100.00)
Net profit	4.65 (7.79)	37.96 (63.62)	9.23 (15.47)	7.83 (13.13)	59.67 (100.00)

Source: *Authors calculation using survey data; *Figures in parenthesis indicates percentage total.*

Table 3: Extent of cost and profit among actors of PR-fine rice (₹.kg^{-1})

Farmers	Producers	Rice mills	Wholesalers	Retailers	Horizontal sum
Purchase price	—	17.59	32.94	37.98	88.51
Production cost	15.84	—	—	—	15.84
Processing cost	—	2.98	—	—	2.98
Marketing cost					
Loading / unloading cost	—	—	0.25	—	0.25
Transportation cost	0.23	1.41	1.75	2.50	5.89
Cost of packaging material	—	1.10	—	—	1.10
Rent on market shop / space	—	—	1.50	1.25	2.75
Tax	—	0.98	—	—	0.98
Total marketing cost	0.23	6.47	3.50	3.75	13.95
Total cost	16.07 (13.58)	24.06 (20.34)	36.44 (30.80)	41.73 (35.27)	118.30 (100.00)
Sale price	17.59	32.94	37.98	43.16	131.67
Value added / margin	1.75 (6.41)	15.35 (56.19)	5.04 (18.45)	5.18 (18.96)	27.32 (100.00)
Profit margin	1.52 (11.37)	8.88 (66.42)	1.54 (11.52)	1.43 (10.70)	13.37 (100.00)

Source: *Authors calculation using survey data; *Figures in parenthesis indicates percentage total.*

rice mills ₹ 24.06 kg^{-1} (20.34%). Producers incurred the least total cost of ₹ 16.07 kg^{-1} (13.58%).

Results of the total valued added to PR-fine rice revealed that rice mills added the most value to the product (56.19%), followed by retailers (18.96) and wholesalers (18.45%). Farmers added the least value to the product (6.41%). Furthermore, highest net profit share was accrued by rice mills, which was found to be ₹ 8.88 kg^{-1} (66.42%), followed by wholesalers, ₹ 1.54 kg^{-1} (11.52%) and farmers, ₹ 1.52 kg^{-1} (11.37%). Least share of net profit from consumers' rupee was recorded by the retailers, ₹ 1.43 kg^{-1} (10.70%). Similar results were reported by Weldeyahanis, *et al.* (2017).

Constraints of rice value chain

The constraints were categorized under the different functions performed by the major actors, which involved production, processing and trading (wholesaling and retailing) constraints as presented under the following headings.

Constraints of paddy production

Paddy farmers in the study area were faced with numerous production and marketing constraints including small-sized operational holding, high cost of production inputs, lack of remunerative price etc. as presented in Table 4. The most pressing constraint in paddy cultivation during the study period was lack of remunerative prices for paddy output as indicated by first ranking and Garrett mean score of 76.33. Other important constraints were small operational holdings (II), spurt in production and heavy arrivals (III), difficulty in accessing credit (IV), and inadequate marketing information. Inadequate marketing information may lead farmers on selling their produce too early or too late, when the produce cannot fetch ruminative price. (V) Shortage of labour during peak production activities was the least paddy production constraint with ninth ranking and Garrett mean score of 30.78. The results are in agreement with the findings of McCarthy *et. al.* (2008).

Constraints of rice processing

The constraints associated with rice processing in the study were presented in Table 5. Perusal of the results revealed that market instability was the number constraint faced by the processors as judged by its Garrett mean score of 63.71, followed by competition with other rice milling firms (II),

Table 4: Paddy production constraints in Haryana

Sl. No.	Constraints	Garrett mean score	Rank
1	Small operational holdings	66.44	II
2	Lack of remunerative prices for paddy	76.33	I
3	High cost / increasing prices of inputs	40.56	VII
4	Shortage of labour during peak production activities	30.78	IX
5	High transportation cost	44.33	VI
6	Inadequate marketing information	47.11	V
7	Spurt in production and heavy arrivals	62.00	III
8	Difficulty in accessing institutional credit	48.56	IV
9	Difficulty in balancing between family consumption and re-investment / sale	30.89	VIII

Source: *Field Survey, 2020.*

Table 5: Constraints faced by paddy processors

Sl. No.	Constraints	Garrett mean score	Rank
1	Irregular supply of paddy for processing	51.14	IV
2	Market instability	63.71	I
3	Management issues	33.00	VII
4	Competition with fellow millers	58.14	II
5	Increased cost of fuel	48.29	V
6	Irregular / erratic electricity supply	38.43	VI
7	Transportation / inadequate policy support for rice exports	56.29	III

Source: *Field Survey, 2020.*

Table 6: Constraints faced by rice wholesalers

Sl. No.	Constraints	Garrett mean score	Rank
1	Distance from the rice mill to shop / warehouse	49.80	III
2	Procurement cost a little bit high due increased transportation cost	64.00	I
3	Competition with other wholesalers	59.00	II
4	Difficulty in accessing credit	43.40	IV
5	Inadequate government support through suitable pricing policy	32.80	V

Source: *Field Survey, 2020.*

Table 7: Constraints faced by rice retailers

Sl. No.	Constraints	Garrett mean score	Rank
1	Increased transportation cost due to increased fuel cost	46.00	III
2	Increased procurement cost	60.75	I
3	Competition with other retailers	49.50	II
4	Difficulty in accessing credit	42.75	IV

Source: *Field Survey, 2020.*

inadequate policy support for rice exports (III), irregular supply of paddy (IV), increased cost of fuel (V), and Irregular / erratic supply of electricity (VI). Management issues, which was mainly conflict of between the management and employees of the mill particularly regarding labour wages was the least constraint faced by the rice milling units with Garrett mean score of 34.33 (VI). Similar constraints were reported by Hussain *et al.* (2010).

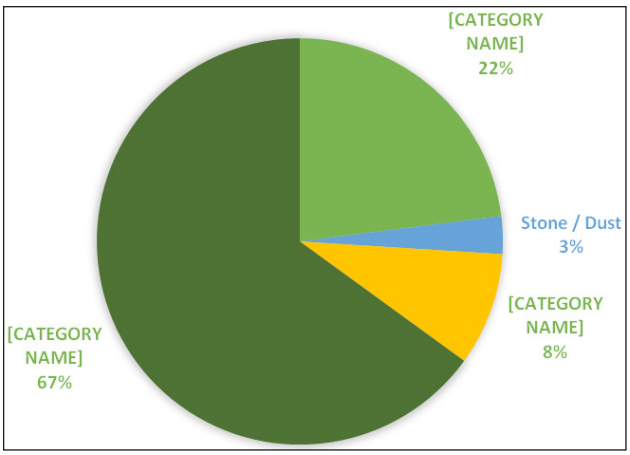

Fig. 2: Percentage rice and by-products in paddy milling

Constraints of rice wholesaling

The constraints bedevilling rice wholesaling in the study area was presented in Table 6. The results revealed that an increased procurement cost due to increased transportation cost was the major wholesaling constraint as evident to its first ranking and Garrett mean score of 64.00. the increase resulted from increased fuel cost, which brought about increased cost of transportation. The other important wholesaling constraints were competition with other wholesalers (II), distance from the rice mill to shop, which was also the resultant effect of increased cost of fuel (III), and difficulty in accessing credit (IV). Inadequate government support through suitable pricing policy was the least constraint experienced by rice wholesalers as judged by fifth position and Garrett mean score of 32.80. Affirmative results were reported by Thanh and Singh (2006).

Constraints of rice retailing

The constraints encountered by rice retailers are similar to those faced by wholesalers in the study area and included fluctuation in price, procurement cost, competition with fellow retailers, among others as indicated in Table 7. Increased procurement cost of rice was the major constraint faced by rice retailers as indicated by its first ranking and Garrett mean score of 60.75. The other important constraints were competition with other retailers (II), increased transportation cost as a result of increased fuel cost (III). Difficulty in accessing credit as judged by fourth ranking and Garrett mean score of 42.75, that procurement cost the biggest constraint faced by rice retailers as indicated by its first ranking and Garrett mean score of 64.33. The other important constraints were competition with other retailers (II), difficulty in accessing capital (III), distance from the market (IV), and market instability (V). Government policy and regulations was the least constraint faced by

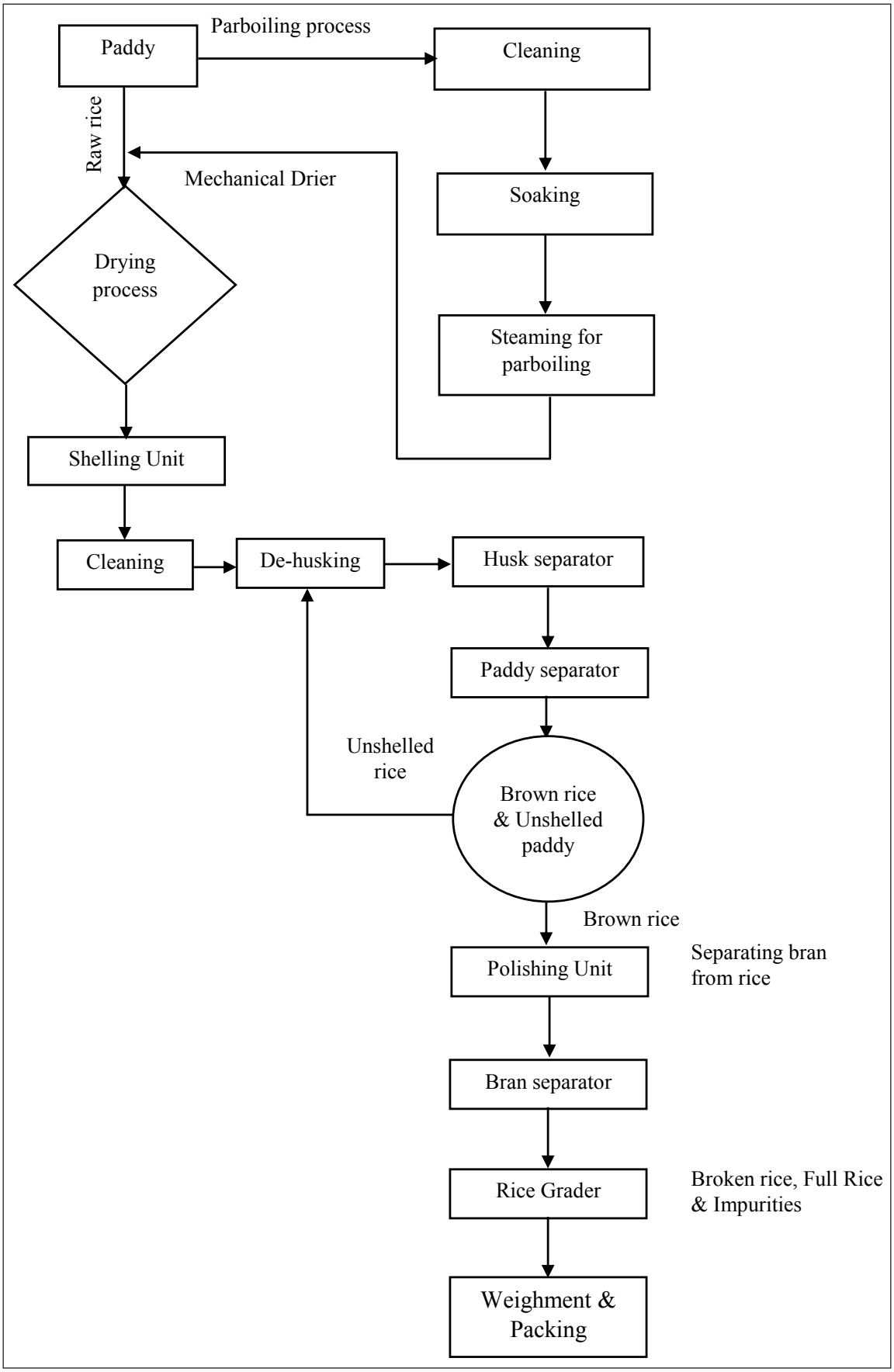

Fig. 3: Flow chart of raw / parboiled rice milling

rice retailers in the study area with sixth ranking and Garrett mean score of 48.00.

CONCLUSION AND POLICY IMPLICATION

Findings of the study indicated that rice value chain has resulted in division of labour among the major actors. Basmati and non-basmati (PR-fine) rice were involved in the value chain. Highest cost was incurred in Basmati and PR-fine rice was associated with retailers (₹ 93.37 kg^{-1} and ₹ 41.73 kg^{-1}), while rice mills added the most value to both Basmati and PR-fine rice (61.34% and 56.19%). Highest profit in Basmati and non-basmati rice was accrued by rice mills (37.96 kg^{-1} and 8.88 kg^{-1}). The major production and processing constraints were lack of remunerative prices and market instability with Garrett mean score of 76.33 and 63.71, respectively, while the major wholesaling and retailing constraints was increased procurement cost as a result of per litre increased cost of fuel. Better remunerative price policy for paddy should be made to entice farmers to produce more and ensure regular supply of paddy to the processing units, which will trickle down to the entire value chain.

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