

An Economic Evaluation of Rice Processing Mills in Jammu District of Jammu & Kashmir Union Territory

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ABSTRACT

The study was conducted in Jammu district. The Jammu district was purposively selected for the study on the basis of maximum number of rice mills in the area. Two Rice mills were selected located in R.S. Pura belt as the area is well known for paddy production. The study was of exploratory nature and convenience method of sampling was used. The mill-1 & mill-2 involves two types of channels for procuring the paddy viz; commission agents-millers (channel-1) & farmers-millers (channel-2). The total cost involved in rice mills through channel-1 and channel-2 was ₹ 2720.28/ qtl. and ₹ 1926.21/ qtl. for mill-1. In case of mill-2, the total cost incurred was ₹ 1963.60/ qtl. and ₹ 3894.35/ qtl. for both channel-1 and channel-2 respectively. The gross returns the mills obtained for both channels were ₹ 2902.50/ qtl and ₹ 4261.50/ qtl for both mill-1 and mill-2 respectively. Thus the net return mill-1 gained was higher in case of channel-2 (₹ 976.29/ qtl.) and for mill-2, net return was higher through channel-1 (₹ 2297.90/ qtl.). Therefore from the study, we have concluded that for mill-1, channel-2 is more efficient and for mill-2, channel-1 is more beneficial.

Keywords: Rice mills, R.S. Pura, CACP, Channels, Commission agent and Gross return

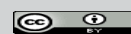
Rice is important to the lives of billions and billions of people all around the world. It is the oldest domesticated grain (~10,000 years) and the staple food for 2.5 billion people and growing rice is the largest single use of land for producing food, covering 9 per cent of the earth's arable land. Rice provides 21 per cent of global human per capita energy and 15 per cent of per capital protein. Calories from rice are particularly important in Asia, especially among the poor, where it accounts for 50-80 per cent of daily caloric intake. As expected, Asia accounts for over 90 per cent of the world's production of rice, with China, India, Bangladesh and Indonesia producing

the most. Only 6-7 per cent of the world's rice crop is traded in the world market. Thailand, Vietnam, China and the United States are the world's largest exporters. 85 per cent of the rice that is produced in the world is used for direct human consumption.

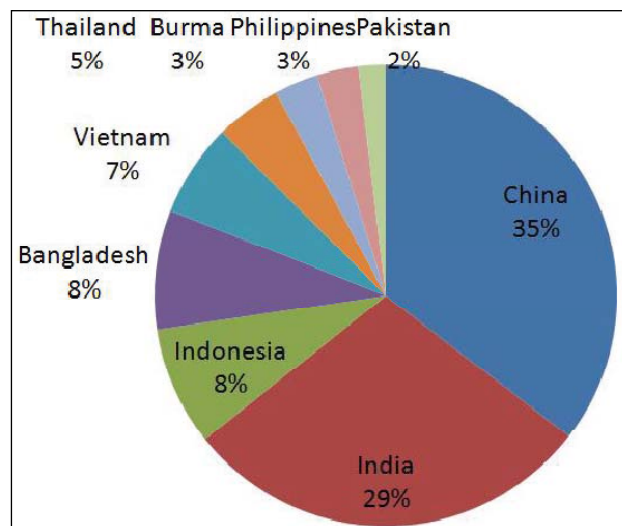
With the largest share of 46.87 million hectares in the world paddy area, India ranks second in production

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next only to China. Paddy accounts for 36.8 per cent of the cultivated area and about 40 per cent of the total food grain production in the country (USDA, 2021-22). In some states of the country viz., Andhra Pradesh, Kerala and West Bengal, rice is a monoculture crop and the source of prosperity and livelihood of a majority of the population.



Source: USDA.

Fig. 1: World Rice Production (2017/18-2021/22)

Rice Production, processing and Marketing constitute the biggest industry in the country. Due to low productivity of rice, growers are not receiving higher income, but there is one way to enhance the income by value added product/processed products of rice like poha, boil rice and non-parboiled rice. So, there is role of Indian rice milling industry. Indian rice milling industry is the oldest and largest agro-based industry. Rice is predominantly consumed in the form of fully milled white rice, which comprises regularly milled as well as parboiled rice and only a small fraction is consumed as brown rice. It is also used in the preparation of processed foods, such as noodles, puffed rice, fermented sweet rice, snack foods, and beverages (such as beer, wine, sake, and vinegar). The process of converting paddy into well-milled, edible, silky-white rice, involves a series of steps such as parboiling, drying, and milling that must be carried out with utmost care in order to produce high-quality rice. The market value of rice depends largely on its physical (moisture content, grain dimensions, weight, density, and color), mechanical (grain strength and elasticity), thermal

properties (specific heat, thermal conductivity, thermal diffusivity, coefficient of expansion), and biochemical properties (Dangi *et al.* 2021).

Rice production in the Jammu and Kashmir is predominantly a mono cropped activity with a very high consumption and most important staple food than other states of India. The area under the rice has increased from 196.00 thousand hectares in 1950-51 to 267.58 thousand hectares in 2020-21. Rice plays an important role in the livelihood of the people in the state, although the area under the crop is very small as compared to other states of the India with only 0.27 m ha [Directorate of Economics & Statistics, J&K, 2020-21].

With the growing demand for rice, both at the global and national level, the required rice production in India by 2030 is estimated to be 138 million tonnes. This implies rice production need to grow by 17% from the current level of 118 million tonnes in 2020 to reach 138 million tonnes by 2030. With the current level of productivity, total area under rice would be 52 million hectares covering almost 38% of the total cropped land (Chakraborty & Sahu Priya, 2020). Thus, the cultivation of the rice in this region offers a great potential for its improvement, but at the same time there is a much worry to the State of J&K in terms of food grain deficiency as it has already touched to 40 percent which will grow in the future as the deficiency is the process which cannot be stopped.

MATERIALS AND METHODS

Locale of the study: The study was conducted in Jammu district of Jammu and Kashmir UT having ample number of rice mills and shellers from which we collected the required data. The reason for presence of these units in Jammu district is the rice production in R.S. Pura belt.

Sampling Design: Convenience sampling technique was adopted for the selection of paddy processing units.

Collection of data: Both primary and secondary data was collected to accomplish the objectives of the study. The primary data was collected from the mill owners related to paddy procurement cost, investment costs, processing cost, marketing cost etc., encountered in the rice milling operations through

pretested schedule by personal interview method. The secondary data was collected from various published sources/agencies such as Annual Reports and other government publication, previous studies and researches pertaining to the title.

Method of analysis of data: By seeing the behavior of the collected data, different types of cost were used and the percentage analysis method is used in order to achieve the objective of the study.

(A) Procurement cost: Those costs which is incurred by the processor for obtaining the produce from farmers or producers.

(B) Fixed cost: Those costs which are not changed with the level of production. E.g. buildings, equipments, machineries etc.

(C) Marketing cost: The costs which are incurred during the movement of a produce between different marketing intermediaries.

$$\text{Percentage analysis} = (X/Y) * 100$$

Where, X = Response of a respondent

Y = Total no. of respondents

- **Marketing channels:** These are the route through which the final product is moved from one market intermediary to another.

RESULTS AND DISCUSSION

Costs incurred by Mill 1 and Mill 2 in paddy procurement

Table 1 presents the costs incurred by rice mills in procurement of paddy for rice milling by two separate channels, namely, purchase directly from the farmers (channel-2) and purchases from commission agents (channel-1). As the table reveals, the purchase price of paddy varied across types of rice mills and channels. It was ₹ 2300 per quintal in channel 1 and ₹ 1800 per quintal in channel 2 for Mill 1. The purchase price, however, was bit higher for both the channels in respect of Mill 2, that is, ₹ 2500 quintal in channel 1 and ₹ 3200 in channel 2. The costs incurred on account of purchase tax, commission and market fee was of fixed proportion of the paddy purchase price. It was 2 per cent of purchase price each in respect of tax and commission and 1.5 per cent in respect of market fee. It may be noted that the mills didn't have to pay any commission for paddy purchased directly from farmers (channel-2). In respect of transport and handling, the cost incurred by Mill 1 was ₹ 13.8 per quintal, when purchasing from the commission agents (channel-1). However, the purchase from farmers (channel-2) led to differential transportation and handling cost of ₹ 9 per quintal in Mill 1 and ₹ 25 per quintal in Mill

Table 1: Costs incurred in procurement of paddy for rice mill (₹/qtl.)

Sl. No.	Particulars	Mill 1				Mill 2			
		Channel 1	% of total	Channel 2	% of total	Channel 1	% of total	Channel 2	% of total
1	Purchase Price (PP)	2300.00	—	1500.00	—	1450.00	—	3200.00	—
2	Purchase tax	0.00	0.00	0.00	0.00	29.00	24.42	64.00	25.56
3	Commission	0.00	0.00	0.00	0.00	0.00	0.00	64.00	25.65
4	Market fee	34.50	40.92	22.50	41.09	21.75	18.30	48.00	19.33
5	Transport and handling	13.80	16.38	9.00	16.43	22	18.50	25.00	10.02
6	Cleaning and weighing	9.58	11.37	6.15	11.23	6.00	5.10	6.50	2.60
7	Packing material	26.22	31.10	17.10	31.25	40.00	33.68	42.00	16.84
	Sub Total (2-6)	84.32	100.00	54.75	100.00	118.75	100.00	249.50	100.00
	Total (PP+ Sub-total)	2384.32	—	1554.75	—	1568.75	—	3449.50	—

Note: Channel-1: Commission Agents---Millers; Channel-2: Farmers ---Millers.

2. The cleaning and weighing charges incurred by the paddy mills differed considerably between the channels. While, the Mill 1 incurred ₹ 9.58 per quintal in channel 1 for cleaning and weighing, the amount spent was lower at ₹ 6.15 per quintal in respect of channel -2. Similar was the case for Mill 2 also. While, cleaning and weighing charges were ₹ 6 per quintal in channel 1, they amounted to ₹ 6.5 per quintal in channel-2. Overall, the total procurement costs were higher in respect of channel- 1 compared to channel -2 for Mill 1 and vice versa in Mill 2. Specifically, the costs were ₹ 84.32 per quintal and ₹ 54.75 per quintal respectively for channel 1 and channel-2 for Mill 1. The corresponding numbers for Mill 2 were ₹ 118.75 per quintal and ₹ 249.5 per quintal.

Cost of processing paddy into rice: Table 2 presents the cost incurred the rice milling units for the processing of paddy into rice. In respect of paddy conversion into rice, as revealed by the table, the two most significant components of total processing cost were expenditure on power, fuel and water and salaries. While these two accounted for 65.8 per cent and 11.96 per cent, respectively in the case of Mill 1

and their share was 38.6 per cent and 22.5 per cent in the case of Mill 2. The other component of processing costs like administrative costs, depreciation on buildings and depreciation on machinery varied for the two types of mills.

Returns from paddy processing

Table 3 presents returns from paddy processing into rice making by both Mill 1 and Mill 2. The products from rice making process were head rice, broken rice, bran and husk. The table reveals that the Mill 1 enjoyed a total return of ₹ 2902.50 by processing one quintal of paddy into rice. This total returns consisted of ₹ 2250 from the sale of head rice, ₹ 350 from sale of broken rice, ₹ 240 from sale of bran and ₹ 62.5 from sale of husk. These components of the total returns were found to be ₹ 4261.5 in Mill 2, which was larger by ₹ 1359 when compared to Mill 1. This differential result was on account of variation in the returns realized across different products. For example, while the sale of head rice fetched the modern units ₹ 3574. The sale of bran fetched ₹ 84 (a decrease of ₹ 156). However, it may be noted that

Table 2: Cost incurred for the processing of paddy into rice (₹/qtl.)

Sl. No.	Particulars	Conversion into rice			
		Mill 1		Mill 2	
		Amount	% of total	Amount	% of total
1	Power, fuel and water	23.99	65.80	20.2	38.59
2	Salaries	4.36	11.96	11.78	22.50
3	Administrative costs	3.5	9.60	7	13.37
4	Depreciation on				
	a) Buildings at 5%	1.68	4.61	4.24	8.10
	b) Machinery and equipments at 10%	2.93	8.04	9.13	17.44
	Total	36.46	—	52.35	—

Table 3: Returns from paddy processing (₹/ qtl.)

Sl. No.	Particulars	Mill 1			Mill 2		
		Quantity* produced (kgs)	Price (₹/ kg)	Value (₹)	Quantity* produced (kgs)	Price (₹/kg)	Value (₹)
1	Head rice	50	45	2250	65	55	3575
2	Broken rice	10	35	350	16.25	35	568.75
3	Bran	15	16	240	5.25	16	84
4	Husk	25	2.5	62.5	13.5	2.5	33.75
	Total **			2902.5			4261.5

*Quantity produced by processing one quintal of paddy

** Total returns from processing a quintal of paddy

Table 4: Marketing costs incurred for the sale of rice by rice mills (₹/qtl.)

Sl. No.	Particulars	Marketing cost			
		Mill 1		Mill 2	
		Channel -1	Channel -2	Channel -1	Channel -2
1	Sales tax and turnover tax @ 2% of sale price	90.00	90.00	110.00	110.00
2	Market fee @ 1.5% of sale price.	67.50	67.50	82.50	82.50
3	Transportation	0.00	35.5	0.00	50.00
4	Packing material	32.00	32.00	40.00	40.00
	Total	189.50	225.00	232.50	282.50

Note: Channel-1: Miller -----Traders at millers gate; Channel-2: Miller-----Open markets.

returns for the Mill 2 from the sale of broken rice were higher at ₹ 568.8. These varying results in respective modern units were given rise to (i).increase in the yield of head rice as well as its price. (ii) increase in the yield of broken rice and (iii) fall in yield of bran. The returns from husk in respect of Mill 2 were less by just ₹ 28.7.

Marketing costs of rice incurred by rice mills

Table 4 presents cost incurred in marketing of rice by Mill 1 and Mill 2. The marketing costs are presented separately for two channels, namely, channel - 1 (sale of rice at mill gate) and channel- 2 (sale of price in open markets). It can be seen from table that, the total cost of marketing per quintal of rice was higher for Mill 2 than for Mill 1. While, the marketing costs amounted to ₹ 232.5 per quintal and ₹ 282.5 per quintal of rice for Mill 2, the corresponding numbers for channel-1 and channel- 2 for Mill 1 were ₹ 189.5 and ₹ 225 per quintal.

An examination of the components of marketing costs reveals that, sales tax formed the major proportion in the total marketing cost. It was ₹ 90 per quintal of rice sold by Mill 1 and ₹ 110 per quintal in Mill 2. The next largest component of marketing costs at 1.5 per cent of sales price was market price, which amounted to ₹ 67.5 per quintal in Mill 1 and ₹ 82.5 per quintal in Mill 2. Next in the order of magnitude was the cost incurred in packing material. It was found to be uniform at ₹ 32 per quintal in Mill 1 and ₹ 40 per quintal in Mill 2. Another component of marketing costs shown by the table is transportation. However, this cost was pertinent only for channel -2 and not for channel -1, since the latter involved sale of rice at the mill gate itself. The transportation

cost in channel- 2 was much higher for Mill 2 which was ₹ 50 per quintal compared to ₹ 35 per quintal in respect of Mill 1.

Marketing costs of by products

Table 5 presents marketing costs of byproducts of rice milling units, namely, bran, brokens and husk. The only two components of marketing costs for the above products were sales tax at 2 per cent of sale price and cost on packing material. However, it was only bran in respect of which sales tax was paid by the rice mills at ₹ 32 per quintal. The total cost incurred in respect of bran, brokens and husk was for the packing material was ₹ 60, ₹ 30 and ₹ 20 per quintal, respectively.

Table 5: Marketing costs of by products (₹/qtl.)

Sl. No.	Particulars	By Products		
		Bran	Broken	Husk
1	Sales tax and turnover tax	32	—	—
2	Packing material	28	30	20
	Total	60	30	20

Net returns realized by rice mills

Table 6 presents the net returns realized by the Mill 1 and Mill 2 from rice milling. As for rice milling process, the rice mills had two channels to dispose of rice, namely, disposal at the mill gate and disposal in the open market. It may, however, be noted that the sale of byproducts like bran, husk etc took place only at the mill gates. The results revealed that the gross returns from the sale of products obtained by

Table 6: Net returns realized by rice mills (₹/qtl.)

	Particulars	Rice mills			
		Mill 1		Mill 2	
		Channel 1*	Channel 2	Channel 1*	Channel 2
1	Gross returns**	2902.5	2902.5	4261.5	4261.5
2	Cost of paddy***	2384.32	1554.75	1568.75	3449.50
3	Processing cost	36.46	36.46	52.35	52.35
4	Marketing cost****				
	(a) Rice	189.5	225	232.5	282.5
	(b) Broken	30	30	30	30
	(c) Bran	60	60	60	60
	(d) Husk	20	20	20	20
	(e) Total	299.5	335	342.5	392.5
5	Total cost	2720.28	1926.21	1963.60	3894.35
6	Net returns	182.22	976.29	2297.90	367.15

* Channel 1: sale of rice at mill gate

Channel 2: sale of rice in open markets

** Overall gross returns from main products and by products

***Cost of paddy includes paddy purchase price and cost of procurement.

Paddy purchase price and procurement price used above are the average for two channels.

****Table 4 and 5 provide per quintal marketing costs of rice and its byproducts. Using this information, marketing costs in the above table were computed for the product quantities obtained by processing one quintal of paddy.

processing one quintal of paddy were to the tune of ₹ 2902.5 in both the channels for Mill 1 and ₹ 4261.5 in both the channels for Mill 2. Cost of paddy consists of paddy purchase price and paddy procurement cost varied across the channels and units. For Mill 1, cost of paddy per quintal was ₹ 2384.32 in channel-1 and ₹ 1554.75 in channel-2. In respect of Mill 2, paddy cost was ₹ 1568.75 in channel-1 and ₹ 3449.50 in channel-2. The total marketing costs, which constituted of cost of selling rice, bran, husk and broken, happen to be ₹ 299.5 in channel-1 and ₹ 335 in channel-2 for Mill 1. However, the total marketing costs were much higher for Mill 2 at ₹ 342.5 for channel-1 and ₹ 392.5 for channel-2.

The net returns varied considerably across units and channels. It can be seen from the table that, the net returns from the sale of the products obtained by processing one quintal of paddy were of the order of ₹ 182.22 in channel-1 and ₹ 976.29 in channel-2 of Mill 1. These numbers were ₹ 2297.90 and ₹ 367.15 for channel-1 and channel-2 respectively of Mill 2.

CONCLUSION

Rice is the main staple food in Jammu area and thus rice mills play an important role. It has been inferred from the study that the two selected mills are adopted two channels viz; Commission agents-Millers (channel-1) & Farmers -Millers (channel-2) for procuring the rice. The cost incurred in procurement of rice for mill-1 was high through channel-1 (₹ 2384.32/qtl.) and for mill-2, cost was high through channel-2 (₹ 3449.50/qtl.). The cost of processing paddy into rice was higher in case of mill-2 than mill-1 and the maximum proportion of cost was of fuel, power and water costs i.e., almost 65.80 per cent in case of mill-1 and 38.59 per in case of mill-2. thus the total cost incurred by rice mill-1 were ₹ 2720.28 and ₹ 1926.21 per quintal for channel-1 and channel-2 respectively. For mill-2, it was ₹ 1963.60/qtl. and ₹ 3894.35/qtl. for both channels respectively. The total cost involved purchase price, cost of processing and marketing costs. the gross returns the mills obtained through main product and byproducts was ₹ 2902.50/qtl. for both channels

in case of mill-1 and ₹ 4261.50/ qtl. in case of mill-2 for both channels. So the returns was high in case of mill-2. The net returns realized through channel-2 was high in case of mill-1 i.e. ₹ 976.29/qtl. and for mill-2, channel-1 was more profitable (₹ 2297.90/qtl.). Thus, we can conclude that mill-2 was obtaining more benefit when compared to mill-1.

REFERENCES

- Anonymous. 2013-14. Directorate of Economics and Statistics, Digest of statistics, J&K, Government of India.
- Agidi, G. and Moyosore, O.K. 2014. Comparative Analysis of the Technical Performance of Selected Rice Mills in Bida, Niger State, *International Journal Of Engineering Research & Technology (IJERT)*, **3**.
- Chakraborty, M. and Priya, P.S. 2020. Sustainability Of Rice Cultivation In India. 1st Indian Rice Congress - 2020 Rice Research and Development for Achieving Sustainable Development Goals, ICAR-NRRI, Cuttack 753006, Odisha, India.
- Dangi, P., Gupta, A. and Garg, I. 2021. Rice Processing and Properties. *Handbook of Cereals, Pulses, Roots*.
- Mysir Jeelani Kaloo, Reena Patidar and Tapan Choure. Production and Productivity of Rice in Jammu and Kashmir: An Economic Analysis. *Int. J. Res. (IJR)*, **1**(4).
- Paman, U., Bahri, S., Asrol and Liana, L. 2016. Distribution and Use Patterns of Small-Scale Rice Mills in Kampar Regency, Riau Province, Indonesia. *Int. Jr. on Adv. Sci. Engg. Info. Tech.*, **6**(2).
- Salgotra, R.K., Gupta, B.B. and Singh, P. 2009. Combining ability studies for yield and yield components in Basmati rice. *Oryza*, **46**(1): 12-16.
- Shwetha, M.K., Mahajanashetti, S.B. and Keru, N.M. 2011. Economics of paddy processing : A comparative analysis of conventional and modern rice mills. *Karnataka J. Agric. Sci.*, **24**(3): 331 – 335.
- Tokida, K., Haneishi, Y., Tsuboi, T., Asea, G. and Kikuchi, M. 2014. Evolution and prospects of the rice mill industry in Uganda. *African J. Agril. Res.*, **9**(33): 2560-2573.

