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CONCLUSIONS

From the foregoing discussion and data presented in the tables, following inferences emerge : (1) The strengthening and effective functioning of the government procurement agencies have resulted in higher and more stabilised post-harvest prices of unhusked rice. (2) The efforts of the government for ensuring a higher share for the producer in the price paid by the consumer through market intervention and price policies have not yielded the desired results. However, in the absence of government intervention and price policies, the producers' interest would have been still more adversely affected. (3) The effective functioning of the government procurement agencies and price policies have helped a lot in providing the producers relatively more remunerative prices. (4) The control of producers over the processing units of rice through their own efficient and well managed co-operative organizations will help them in getting a better share in the consumer's price. This act would also lead to a more equitable distribution of agricultural income.

EFFICIENCY AND EQUITY OF FARM PRICES IN ASSAM STATE–A CASE OF SMALL FARMERS

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Pricing efficiency is concerned with improving the operation of buying, selling, and pricing aspects of the marketing process so that it will remain responsive to consumer direction. In traditional agriculture as in Assam, the marketing system which is outmoded, inadequate, and devoid of infrastructural facilities has been serving as a serious constraint on the development of the agricultural sector and has resulted in unremunerative prices to the producers. To achieve maximum economic efficiency in terms of reduction in costs, margins, wastes, and price spreads of farm products, an efficient pricing system is needed. On the other hand, the differences in prices received by different groups of farmers can be viewed through differences due to time, place and form of sale. The economic environment affects the bargaining power of the groups differently resulting in wider price spread among different groups of farmers. The price spread of a particular product is also affected by the total consumers, their bargaining power, price of substitute crop and total production. Moreover, market news for improvement, labelling for information, grading and standardisation also affect the pricing efficiency. In a particular market environment, pricing efficiency affects the equality of prices received by the farmers for their produce. Prices are inequitable in the same market at the same point of time among different groups of farmers. It is, therefore, necessary to analyse the agencies and the channels through which the surplus moves and the reasons of price spread and the factors responsible for inequality in prices among the groups of farmers.

SAMPLING, DATA AND METHOD OF ANALYSIS

The study was conducted in Kamrup district of Assam during 1982-83 crop year. Samples were based on small farmers and four villages were selected at random having maximum number of small farmers under Pantan tehsil of Gauhati sub-division. Multi-stage stratified random sampling was followed and a set of 120 small farmers, 30 semi-medium, 20 medium and 8 large farmers were selected based on the criteria followed by the Small Farmers Development Agency. Tabular as well as functional analyses were carried out to

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study the pricing efficiency and equity. To examine the pricing efficiency, marketing margins and costs were studied through various channels of distribution for different groups of farmers. The equity aspect was examined by analysing the various factors affecting net prices received by the farmers with the help of a modified perfect market model. This was particularly chosen to relate basic economic theory with *(i)* general price level, *(ii)* differences due to form, space and time dimensions and *(iii)* competitive condition with a specific price level. This can be explained as

$$P=f(X,Y,Z) \ldots (i)$$

where P is the specific price received by a farmer per quintal, X is the general price level, Y is the difference in prices due to their space, form and time dimensions and Z is the competitive condition in the market depicted through types of buyers and sellers in the market. A set of dummy variables was used in this model to quantify the effects of time, space and form dimensions influencing the net prices received by the farmers. The ultimate model can be formulated as

$$R = a + BX + CD + e_{xD} \ldots (ii)$$

and which can be decomposed as

$$R_i = a_0 B_1 X_{1i} + B_2 X_{2i} + B_3 X_{3i} + B_4 X_{4i} + C_1 D_{1i} + C_2 D_{2i} + C_3 D_{3i} + C_4 D_{4i} + C_5 D_{5i} + C_6 D_{6i} + C_7 D_{7i} + e_{xj} D_k \quad \ldots (iii)$$

where R_i is the net prices received by the farmers in rupees per quintal by ith individual, X_{1i} is the size of lot sold in quintals, X_{2i} is the borrowing ratio expressed in percentage, X_{3i} is the storage capacity in quintals, X_{4i} is the total value of marketed surplus in rupees, D_{1i} to D_{7i} are the dummy variable representing moneylender-cum-traders (D_{1i}), traders at town place (D_{2i}), Government agency (D_{3i}), consumer (D_{4i}), February to May time period (D_{5i}), June to September time period (D_{6i}), October to January time period (D_{7i}), a_0 is the intercept term and $e_x D_k$ is the error term of regression due to X and D. The dummy variables representing form and space dimensions were ignored as the study was concentrated in one market for the common form of rice.

EMPIRICAL FINDINGS AND DISCUSSION

I

The relative pricing efficiency of rice was studied through the price spread in each channel of distribution in which different market middlemen like itinerant village traders, moneylender-cum-traders, shopkeepers, wholesaler-cum-millers, government agents, STATFED, fair price shops and government nominees were responsible for increasing the price spread for each category of farmers. Ten channels of distribution are identifed, *viz.*, *(i)*producers – moneylender-cum-traders – wholesaler-cum-millers – retailers – consumers, *(ii)* producers – itinerant village traders – moneylender-cum-traders – retailers – consumers, *(iii)* producers – government agents – STATFED – GPSS – Sub-agents – consumers, *(iv)* producers – government agents – STATFED – fair price shops – consumers, *(v)* producers – shopkeepers – itinerant village traders – retailers – consumers, *(vi)* producers – wholesaler-cum-millers –STATFED – GPSS – government nominees – consumers, *(vii)* producers – wholesaler-cum-millers – STATFED – fair price shops – consumers, *(viii)* producers – government agents –STATFED – government nominees – fair price shops – consumers, *(ix)* producers –wholesaler-cum-millers – retailers – consumers and *(x)* producers – consumers.

The semi-medium and medium farmers followed all the channels except channel V. However, the large farmers followed only channels III, IV, VI, VII, VIII and IX. The study

TABLE I. FARM PRICES, TOTAL PRICE SPREAD, MARGINS AND COSTS FOR SMALL AND SEMI-MEDIUM FARMERS FOR RICE IN ASSAM DURING 1982-83

Channels of distribution	I	II	III	IV	V	VI	VII	VIII	IX
Producers' gross prices (Rs.)	126.00 (128.25)*	128.84 (127.50)	122.00 (122.00)	122.00 (122.00)	123.50 —	126.00 (130.25)	126.50 (121.20)	122.00 (122.00)	128.50 (132.50)
Producers' net prices (Rs.)	119.70 (121.70)	122.29 (121.00)	115.20 (115.13)	115.25 (115.30)	117.15 —	118.20 (124.53)	117.35 (124.50)	112.20 (115.30)	121.25 (125.20)
Consumers' price (Rs.)	182.90 (179.80)	179.80 (179.80)	173.60 (173.60)	173.60 (173.60)	182.90 —	173.60 (173.60)	173.60 (173.60)	169.92 (164.92)	173.60 (179.80)
Total average costs (Rs.)	34.50 (34.74)	33.95 —	61.85 (34.65)	60.65 (62.02)	37.15 (61.05)	68.57 (68.08)	67.32 (66.37)	66.10 (65.49)	26.05 (25.60)
Weighted average costs (Rs.)	8.50 (8.77)	8.52 (8.73)	12.34 (15.60)	15.28 (13.40)	8.77 —	13.42 (13.72)	16.38 (16.64)	16.22 (16.42)	8.48 (8.58)
Total price spread (Rs.)	56.90 (51.52)	51.32 (52.30)	51.60 (51.60)	51.60 (51.60)	59.40 —	47.60 (43.35)	47.10 (43.00)	42.92 (47.42)	45.10 (47.30)
Total net margins (Rs.)	28.60 (23.06)	23.57 (23.74)	3.98 (3.58)	2.60 (2.45)	28.60 —	-8.40 (-14.05)	-10.17 (-16.02)	-11.38 (-10.87)	26.80 (28.40)
Price spread as per cent of consumers' rupee	31.11 (28.67)	28.54 (29.09)	29.72 (29.72)	29.72 (29.72)	32.48 —	27.41 (24.97)	27.17 (24.42)	26.01 (26.02)	25.98 (26.31)
Producers' share in the consumers' rupee (per cent)	68.69 (71.33)	71.47 (70.91)	70.28 (70.28)	70.28 (70.28)	67.52 —	72.50 (75.03)	72.83 (75.58)	73.98 (73.98)	74.02 (73.69)

* Figures in parentheses pertain to semi-medium farmers.

revealed that the highest price received by the small farmers was Rs. 128.50 per quintal offered by the wholesaler-cum-millers and the lowest price was Rs. 122 offered by the government. All the three categories of farmers received the highest prices from the millers who procured directly from the farmers. They earned more than 12 per cent profit as a percentage of purchase price in all the categories of farmers. The total average costs in the marketing channels of small farmers ranged from Rs. 26.05 to Rs. 68.57 with a total price spread of Rs. 45.10 to Rs. 59.40. The highest retail price in the case of small farmers was found in channel V with total average costs of Rs. 37.15 and also the total price spread of Rs. 59.40 with a total net margin of Rs. 28.60. The margins and costs were found to vary from one agency to another between the channels and within the same channel. The highest share of of the producer in the consumer's rupee was 74.02 per cent under channel IX (Table I.) This channel exhibited the lowest total average costs, the lowest weighted average costs and the highest producer's share in the consumer's rupee. Next, channel VIII in which government operated through the policy of 20 per cent levy also benefited the producers and consumers. But this channel is not practically feasible in terms of total procurement procured by the millers. Even other channels in which government worked as the sole intermediary through integration could neither benefit the producers nor the consumers. With the increase in the size of holding, the free trade of wholesalers raised

the producers's share in the consumers' rupee to a higher level. However, this share was still lower than the share exhibited through the channel of government levy system.

The study of marketing costs according to farm size showed that the small farmers incurred relatively higher costs to market their produce. In all categories of farmers, a larger portion of cost was incurred due to transportation, cleaning and drying and a considerable portion due to spoilage, deterioration and loss in weight. However, these costs gradually decreased with the increase in farm size. The highest average costs of marketing was incurred by STATFED (Rs. 50.75) followed by wholesaler-cum-millers (Rs. 14.72) and village traders (Rs. 9.45). The lowest average cost of marketing was incurred by the fair price shops (Rs. 0.75). With the increase in farm size, marketing costs were found to decrease. In private trade, retail prices were found to increase with the increase in farm size. The moneylender-cum-traders offered Rs. 126 per quintal while the itinerant village traders offered Rs. 128.48 per quintal to the small farmers. In the case of semi-medium and medium farmers, the moneylender-cum-traders offered Rs. 128.25 and Rs. 128.75 respectively while the intinerant village traders offered Rs. 127.50 and Rs. 128.50 per quintal respectively. The small and semi-medium farmers who sold parboiled rice in small lots in the village hats incurred a cost of Rs. 32.25 and Rs. 27.53 per quintal respectively. The rice sold through the fair price ships by the government at relatively lower prices was mainly consumed by the weaker sections. The economically sound consumers were found to be reluctant to consume

TABLE II. FARM PRICES, TOTAL PRICE SPREAD, MARGINS AND COSTS FOR MEDIUM AND LARGE FARMERS FOR RICE IN ASSAM DURING 1982-83

Channels of distribution	I	II	III	IV	VI	VII	VIII	IX
Producers' gross price (Rs.)	128.75 —	128.50 —	122.00 (122.00) *	122.00 (122.00)	134.25 (138.25)	134.10 (138.25)	122.00 (122.00)	134.25 (138.25)
Producers' net price (Rs.)	122.55 —	122.38 —	115.35 —	115.35 —	127.60 —	127.50 —	115.40 —	127.00 —
Consumers' price (Rs.)	182.90 —	182.90 —	173.60 (173.60)	173.60 (173.60)	173.60 (173.60)	173.60 (173.60)	173.60 (173.60)	182.90 (186.00)
Total average costs (Rs.)	34.65 —	34.57 —	61.90 (62.10)	60.95 (60.67)	68.02 (67.85)	66.62 (66.52)	65.32 (65.30)	25.85 (25.60)
Weighted average costs (Rs.)	8.70 —	11.28 —	12.45 (12.46)	15.30 (15.20)	13.62 (13.49)	16.71 (16.68)	16.38 (16.35)	8.65 (8.56)
Total price spread (Rs.)	54.15 —	54.40 —	51.60 (51.60)	51.60 (51.60)	48.65 (35.35)	39.50 (35.35)	42.92 (42.92)	48.65 (47.75)
Total net margins (Rs.)	25.60 —	25.55 —	4.10 (3.65)	2.50 (0.82)	-18.12 (-21.25)	-19.37 (-22.40)	-11.80 (11.88)	29.40 (28.65)
Price spread as per cent of consumers' rupee	29.61 —	29.74 —	29.72 (29.72)	29.72 (29.72)	28.02 (20.36)	22.75 (20.36)	26.02 (26.02)	26.60 (25.67)
Producers' share in consumers' rupee (per cent)	70.39 —	70.26 —	70.28 (70.28)	70.28 (70.28)	71.98 (79.64)	77.25 (79.64)	73.98 (73.98)	73.40 (74.33)

* Figures in parentheses pertain to large farmers.

such rice due to poor quality and bad smell of insecticide residues. Due to the multiplication of channels, the prices received by the small farmers ranged from Rs. 123.50 to Rs. 128.50 whereas it ranged from Rs. 127.50 to Rs. 132.50 for semi-medium, from Rs. 128.75 to Rs. 134.25 for medium farmers in the open market trade. The highest price received by the large farmers was Rs. 138.25. The corresponding retail prices for small, semi-medium, and large farmers varied from Rs. 173.60 to Rs. 182.90, Rs. 179.80, Rs. 182.90 and Rs. 186 respectively. The price differences both at the producers' and consumers' level arose due to imbalance in social and economic power and also the nature of competition in the market process. Multiplication of middlemen and their exorbitant margins which far exceeded the transportation cost and cost of storage over a period of time caused the rice marketing to deviate from idealism making the price inefficient. Moreover, lack of market news for improvement, labelling and information, lack of grades and standards turned the market collusive, exploitative leading to inefficient pricing system.

II

Under perfect market situation a market is said to be equitable when the price differential between groups of farmers does not exist in the same market. It is often said in marketing literature that there are economies of scale in marketing and hence there is a direct relationship between prices per unit received and the quantities sold at any one time. This established a positive relationship between lot size and price per quintal. A lot of 95 farmers sold paddy in a lot size below two quintals receiving Rs. 126.50 per quintal. The highest price of Rs. 138.25 per quintal was found realised with a lot size of above 11 quintals. The bargaining power that resulted from sound financial standing reflected in freedom from debt and higher liquidity position helped to extract a higher price for the produce, compared to farmers with weak bargaining power. The proxy of liquidity position of farmers used here was the value of receipt from the sale of all crops during the year. The study showed that about 70 farmers having a bargaining power of below Rs. 2,000 obtained Rs. 123.50 per quintal. Fewer farmers had higher bargaining power of above Rs. 8,000 and a group of 27 farmers realised Rs. 138.25 per quintal taking advantage of seasonal price rise. The extent of source and nature of indebtedness among farmers also affected the marketing practices of rice with regard to time of sale and agency to whom it was sold in addition to adverse effects on bargaining power in the market. The farmers who borrowed from institutional agency were bound less to make sales to the institution than those borrowing from moneylender-cum-traders. The study thus established an inverse relationship between the borrowing ratio of the farmers and the average prices received by them. The farmers who borrowed more than 75 per cent of the total borrowing received the lowest prices for the paddy sold by them. About 130 farmers who were indebted to only institutional sources of credit or not indebted at all received the highest price of Rs. 132.75 per quintal. Differences due to quality of the product showed that 22.47 per cent of the farmers cultivated HYV paddy in the *rabi* season representing 5.61 per cent of the total production of the sample farmers. However, the price of local variety at Rs. 129.34 per quintal was higher than that of the HYV which fetched Rs. 124.50 per quintal. The other factors like agency of sale also influenced the net prices received by the farmers. Agencies operating at a bigger level enjoy economies of scale and pay a higher price to attract larger volumes. Those agencies which are located in market places enjoy different prices. The study revealed that 90 farmers who sold paddy directly to consumers received Rs. 179.80 per quintal followed by 28 farmers who sold to the wholesaler-cum-millers receiving Rs. 129.15 per quintal. Only 31 farmers sold paddy to the moneylender-cum-traders at Rs. 126.18 and a lot of 15 farmers sold paddy to the STATFED at Rs. 122 per quintal. It was thus evident that the price per quintal offered by different agencies varied directly with the volume handled.

In an imperfect market, delayed sales can result in prices much higher than what can be accounted for by storage costs. Paddy sold during October to January, immediately after harvest, fetched the lowest price of Rs. 124.48. Sales in off-season during February to May and June to September resulted in higher prices which were Rs. 129.13 and Rs. 136.26 respectively. Hence, there is reason to believe that the markets are not temporally integrated and, therefore, far from perfect.

The results of the multiple regression analysis carried out separately for different groups of farmers to examine the dissimilar effects on different categories of farmers with respect to price received for similar products showed that the variation in prices explained by the explanatory variables was higher for semi-medium and medium farmers than that for small farmers. This indicated that some exogenous factors were responsible in affecting the net prices received by the small farmers. Following are the results of the multiple step regression analysis showing the significant variables.

Small farmers

$$R = -26.31 + \underset{(2.22)}{58.58D_1} + \underset{(1.88)}{47.41D_2} + \underset{(2.59)}{16.88D_4} + \underset{(1.62)}{39.81D_5} - \underset{(4.16)}{28.60D_7} \qquad R^2 = 0.47$$

Semi-medium farmers

$$R = -1030.65 + \underset{(16.61)}{27.36X_1} + \underset{(2.37)}{19.76X_2} + \underset{(2.03)}{0.074X_4} + \underset{(1.72)}{53.42D_2} + \underset{(1.48)}{40.48D_6} \qquad R^2 = 0.8578$$

Medium farmers

$$R = -1240.34 + \underset{(8.013)}{18.79X_1} + \underset{(2.007)}{49.26X_2} + \underset{(1.700)}{193.78X_4} + \underset{(2.462)}{54.26D_6} + \underset{(2.013)}{29.51D_7} \qquad R^2 = 0.686$$

Pooled farmers

$$R = 40.003 + \underset{(2.739)}{3.267X_1} + \underset{(3.265)}{12.485X_4} + \underset{(2.972)}{24.098D_2} + \underset{(1.257)}{34.116D_4} + \underset{(1.311)}{34.527D_5} + \underset{(1.524)}{4.375D_6}$$

$$R^2 = 0.3884$$

Figures in parentheses indicate 't' values.

The negative regression coefficient of October to January time period for small farmers clearly indicated that the net prices received by the small farmers during this period were adversely affected due to sales after harvest. Similarly, the October to January time period affected the net prices of medium farmers significantly. The positive coefficient of October to January time period for semi-medium and medium farmers indicated the sales of old surplus grains at higher prices. The overall significant effect was mainly due to lot size, traders at town place, total value of marketed surplus, consumers, February to March and June to September time period. However, the low value of R^2 indicated the influence of other exogenous variables for making the prices inequitable under imperfect situation. The time of sale was found to be an important factor for all categories of farmers. They realised higher prices for larger lots, increased bargaining power, and for selling rice directly to the consumers. Prices of paddy after a seasonal decline during the post-harvest marketing period continued to rise till the new crop arrived in the market in the next year.

An analysis of premium or discounts in prices received by the farmers showed that the higher prices were offered by the consumers and traders to all classes of farmers and they were directly related to the size of holding (Table III). The size of holding and premium received established a positive relationship. The small farmers sold rice at lower prices to the consumers, traders and moneylender-cum-traders. The large and medium farmers earned a higher premium than the small and semi-medium ones. The differences of prices received by the large and medium farmers were highly significant. The mean price received

TABLE III. PRICE DIFFERENTIALS DUE TO AGENCY OF SALES OF RICE IN ASSAM DURING 1982-83

Category of farmers	Premium/discount in Rs./qtl. due to agency of sale			Price differentials due to agency of sale between categories in Rs./qtl.			Mean prices received (Rs./qtl.)
	Sale to consumer	Sale to traders	Sale to money-lender-cum-traders	Between consumers and traders	Between consumers and money-lender-cum-traders	Between traders and money-lender-cum-traders	
Pooled	+1.83	0.76	+1.78	+25.95	+38.60	+12.65	160.26
Large	+3.43	2.56	–	+16.00	–	–	176.82
Medium	+1.86	+1.18	+3.05	+10.54	+35.34	+10.54	169.74
Semi-medium	+0.82	−6.40	+0.19	+27.16	+25.10	+7.94	161.40
Small	−2.17	−8.70	−3.51	+26.35	+39.75	+12.90	156.28

(+) Indicates premium, (−) discount.

by the small farmers was significant at 5 per cent probability level with a relatively higher degree of standard error. However, all categories of farmers received price premiums due to time of sale (Table IV). The differential of prices received by the small farmers was found to be the highest due to higher prices in June to September as compared to prices received in February to May.

TABLE IV. PRICE DIFFERENTIALS DUE TO TIME OF SALE OF RICE IN ASSAM DURING 1982-83

Category of farmers	Premium/discount in Rs./qtl. due to time of sale		Price differentials due to time of sale between categories in Rs./qtl.
	For sale in January to September	For sale in February to May	
Pooled	32.82	19.05	13.77
Large	31.14	18.83	10.31
Medium	31.25	20.93	10.32
Semi-medium	35.19	23.54	11.65
Small	37.28	22.93	14.35

CONCLUSION AND POLICY IMPLICATION

It can be concluded that the pricing efficiency depended on various channels of distribution which were affected by marketing margins and costs. There was an inverse relationship between marketing costs and size of holding and a direct relationship with the length of the channels. The produce of the small farmers was costly to market relative to the produce of their counterparts in the higher size-groups, making their prices inefficient. The most efficient channel was considered to be the producer-wholesaler-cum-millers - retailers-consumers in which both the producers and the consumers were benefited in terms of total effectiveness. The intervention of the government could help neither the producers nor the consumers with less total coverage in trade. The prices were found to be inequitable among different groups of farmers due to the time of sale, agency of sale, and the total volume of marketed surplus. Winter rice, direct selling to consumers, local variety fetched higher prices. The study concluded that the bargaining power of the small farmers needs to the improved to enable them to get higher prices by providing storage and credit facilities so as to prevent post-harvest sales. Finally, the marketing environment needs to be improved through appropriate policies and programmes to prevent price inequality among farmers, exploitation of middlemen who earned a high profit margin.